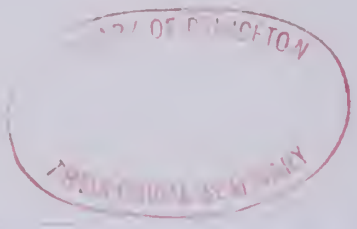

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ASIATIC SOCIETY OF BENGAL,

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"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted: and it will die away, if they shall entirely cease."

SIR WM. JONES.

CALCUTTA:

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ASIATIC SOCIETY.

No. IV. 1864.

On the application of the Characters of the Roman Alphabet to Oriental Languages.—By Capt. W. NASSAU LEES.

I cannot call the paper I am about to read to you this Evening a "scientific paper," and perhaps I owe this meeting some apology for reading it within these walls: but the name of our illustrious founder is so often associated with the question which I have discussed, and the subject is so intimately connected with the labours of such distinguished members of our Society as James Prinsep, H H. Wilson, E. Thomas, E. C. Bayley, General Cunningham, Babu Rajendra Lall Mitra &c., that I have thought it would not prove wholly uninteresting to you.

The substitution of the Roman for Oriental alphabets is a question that about some thirty years ago occupied the attention of educationists and others in India. It did not make much progress at first, nor find favour outside missionary circles; and for a long time the subject would seem to have slumbered. Within the past few years, however, it has occupied the attention of certain distinguished members of the German school of Orientalists; Sanskrit books have been printed in it; and Dr. Sprenger, an eminent Arabic scholar, well known in India, has written two able and interesting articles in the *Augsburgh Gazette*, which within the last few weeks have been republished in Calcutta, advocating the change, as one necessary to enable the languages of the East to become the vehicles of conveying western ideas to the people of this country. As long as the discus-

sion regarding the introduction of the Roman alphabet, into India, was confined to missionaries, it was not necessary for us to meddle with it; but when it is taken up by such high authorities, as those who are now interested in it—and has been removed, as it were, from the arena of controversy, considering the important bearing it has on the intellectual progress of an empire containing very many millions of souls, it is one that ought not to be treated lightly; but in a sober and philosophic spirit, such indeed as that adopted by my esteemed friend Dr. Sprenger, in his paper alluded to.

In considering every question, however, in which a variety of interests are involved, or which is peculiarly liable to be acted upon by circumstances outside and foreign to the end ultimately to be arrived at, it ought to be a *sine qua non*, that prior to its discussion, that end should be so fixed and determined, that we shall know exactly what we desire to accomplish, and that during its discussion the arguments used shall tend solely to that finite point where *proof* of the proposition or theorem proposed for demonstration can be found.

Now in the discussions on the subject of romanizing the Oriental alphabets carried on many years ago, the parties engaged in them had far too much of the character of partizans to arrive at any sound conclusion. Dr. Sprenger has fallen into error in supposing that Dr. Tytler, the two Prinseps, and Sir Charles Trevelyan, were in accord in these discussions. They were wholly opposed; but their opposition may be traced, I think in a great measure to partizanship. In those days there were two schools of educationists in India—the orientalists and the anglicists. The former, in these discussions, was represented by James and Thoby Prinsep and Dr. Tytler. The latter by Messrs. Macaulay and Trevelyan, Dr. Duff and other missionaries. The question they fought, though nominally the battle of the alphabets, was quite as much a battle of languages, and this question has perhaps also been too much mixed up with the real one by Dr. Sprenger.

Missionaries again,—and I do not suppose they make any secret of it,—advocate the adoption of the Roman alphabet, rather because they believe it will aid them in the work of conversion, than from a conviction of its greater suitableness for the purposes of writing oriental languages, and from that source, therefore, we can hardly look for wholly unbiassed conclusions.

A third class would adopt the Roman in preference to the Oriental

characters, because books printed in them could be sold cheaper, and to this school belong, I believe, all German orientalists who are in favour of the change, except perhaps Dr. Sprenger himself. The Germans, it is an admitted fact, are the best Oriental scholars in the world. Indeed, it is almost impossible to find a Sanscrit scholar now, who is not a German; and it is a grave disgrace to England and to India that such should be the case. They buy a very great number of Oriental books, and they would naturally like that the price of these books should suit their purses. I would not, however, be understood to allude to the learned Lepsius. His papers deal chiefly with unlettered languages. Nowhere would cheap books be of greater advantage than in India, but admitting the fact, we must admit also that *that* is not the whole, nor yet the main part of the question we have to decide. Every one will readily grant that it would be an immense convenience, and an immense advantage, to have a universal alphabet—if to the difficulty of learning a new language, we had not to add the difficulty of learning a new and perhaps complicated system of letters, bristling with hooks and points. In short, since the general introduction of steam navigation and rail-roads, &c., the idea of a universal alphabet seems quite natural. Nay, since almost all civilized nations, though thousands of miles apart, can now communicate with each other, by means of electricity, it seems strange that we should not ere this have had,—not a universal alphabet; but a universal language,—so strange that were Julius Cæsar to rise from his ashes, and to ask why all the world were not speaking and writing Latin, we should be somewhat puzzled for a ready reply. In regard to language, the curse of Babel would be a convenient if not a sufficient answer; but in the matter of the alphabets we could not unfortunately excuse ourselves so easily. It will not be a waste of time then to inquire why such has not taken place; and first I will state that I propose to look at the question, not as a theological, a philosophical, or an educational question—nor a question of expediency, nor of policy, nor yet one of price; but one simply of sounds and symbols: and viewing it as such, it does not appear difficult to assign reasons why the Roman alphabet could not take the place of all the alphabets which are now used in India with advantage to the languages themselves or the people who read and write them.

Dr. Sprenger, in his article, has given us illustrations from the

Arabic alphabet; but though he has dealt only with this one character, his proposal seems to be more comprehensive. In India, however, though we have a great many alphabets, all are off-shoots of two parent stems, or possibly in the remotest antiquity of only one. These two great progenitors of the large family of alphabets and modifications of alphabets with which medals and inscriptions have furnished us, are the *Pali*, or the true primitive alphabet of India, and the Phœnician, or Phœnico-Babylonian alphabets. Reading briefly the historic records of these alphabets, so far as they go, we find, that though the limits of the *Pali* language and its alphabets are not very accurately known, from the widely extended range over which *lât* and rock-cut inscriptions in this character have been found, we must concede to them an extensive domain. These inscriptions are chiefly to be found in the central belt and northern part of the Peninsula, and they carry us back 2,400 years, or to about 550 B. C. though probably the characters of this alphabet may have been in use at a much earlier period. The pure Sanskrit element would not seem to have made its appearance in India for several centuries later, or rather I should say, we have no *rock-cut* record of it. Coexistent with the *Pali* alphabet, which occupied the central division of India, for at least 250 years B. C., were the Bactrian alphabet of the North-Western, and the Dravidian languages, (apparently without any written characters) of the southern division of the Peninsula, the limits of the former extending almost to the confines of Persia, and those of the latter from the Vindian hills and the river Narbudda, to Cape Commorin. The early history of the Dravidian colony and their languages, is somewhat obscure; but there is internal evidence in the structure of some of their languages, viz. Tamil and Telugu, to prove that, though they have occupied the South of India from very remote ages, they were of Scythian origin, and it is assumed that they entered India by the same route as the Sanskrit-speaking people. Their languages then, though at present not wholly unallied to the Indo-Aryan family, are not of them; but their alphabets would seem to have been remotely derived from the same models, though how they came to differ in their existing forms so widely is not clear. That they are more modern does not admit of a doubt, but for the rest the matter is involved in much uncertainty. The points regarding which we are left in the dark are—When did the Sanskrit speaking colony

come, and when they did come, whom did they find in India? Was it the original tribes of the country, and did they exterminate them so completely as to leave not a trace of their language—or was it an earlier emigration of Scythian colonists, and did they drive them southward before them so effectually as to leave no land-marks of their occupation behind them? These are questions admitting of much argument; but which I must leave to be discussed by those whom they concern—the students of language and ethnology, and turn again to our alphabets.

The Bactrian alphabet, on the contrary, owes nothing to the Indian model. It has been satisfactorily established that it is one of the many off-shoots from the Phœnician parent tree.

Now the Phœnico-Babylonic alphabet is the most ancient of which we have any historic record. Monsieur Renan in his *Histoire générale des langues Semitiques*, (probably following Gesenius who some twenty-five years previously had expressed a similar opinion,) thinks there is evidence sufficient to shew that the Hebrews wrote in this alphabet on going up out of Egypt. I cannot say any thing for or against this surmise; but be it as it may, there is little doubt that modifications of this alphabet were in spontaneous use from the banks of the Indus to the straits of Gibralter, by the people of the whole world as it was known to the ancients, about the eighth century before Christ. From it the Greek alphabet was modelled; from it the Aramaic, the Syriac, the Hebrew, the Arabic and the many modifications of these alphabets have sprung; *and from it, also, we have the Roman alphabet.*

It would be impossible in a brief, hurried, and imperfect memorandum, such as this, to give even a cursory outline of the history of the progressive development of these alphabets, even if I had full materials for the purpose; which is not the case. For a long time we had no better guide than Gesenius' work, published now some thirty years ago; but Dr. Levy's *Phonizische Studien*, and the due de Luynes' valuable tables printed by Mr. E. Thomas, and since published inscriptions, have added much to the world's knowledge on this subject, which is at once so interesting and instructive to the palæographer, the philologer, and the historian. But still light is required,—more light,—and it is satisfactory to know that able scholars are deeply engaged in investigating the comparative palæography, as well as its

cognate subject, the comparative philology of Eastern languages. The East it is now acknowledged must be the starting point with all who would study the history of man as well as the science of language, and the art of writing. The last mail received from England, brought the announcement of the publication of no less than two books which promise to be of great value to all who are interested in these subjects, *Levy's Phoniziches Worterbuch*, or a sequel to his *Studien*, and *Spiegel's Eran das Land Zwischen der Indus und Tigris*, and our German oriental students work with such a will in the fields of oriental research, that we may confidently expect each year to increase our store of information. Whether they will succeed in finding Abraham, Zarathustra, and the leader of the Aryan colony which overran India, sitting under the same fig-tree, framing languages and alphabets for the whole world, is a question yet admitting of very great doubts, but there is no doubt that if ever they have done so, and left any traces behind them, our friends will find them.

Assuming the correctness of the facts above stated, it will be seen that excluding the immediate consideration of the Pahlawi and Zend alphabets, we have two primitive alphabets to deal with—the Indian and the Phœnician; and from these two alone the very numerous alphabets of almost of all the written languages of Europe, Africa, America, and half of Asia have been drawn.

We have the very best evidence moreover, viz. clearly written inscriptions on tablets, coins, and rocks,—to prove that many of these derivative alphabets are of very great antiquity, and this of itself, though not a practical objection to the substitution of a good for a bad, or a perfect for an imperfect alphabet, must nevertheless always present a very serious difficulty to the engrafting of *new* alphabets on *old* languages. Most nations take an intense pride in the antiquity of every thing belonging to them; and no nations possess this characteristic in a greater degree than Oriental nations. This difficulty, of course, is much heightened if the character in which the language is written, as well as the language itself, is sacred, which is the case with the two classical languages of India. It is almost superfluous to mention that the Brahmanas are of divine origin; that the language of the *Vedas* is the language of the gods; and as for their alphabet, its designation, the *Deva Nagari*, renders it unnecessary to say whence it has been derived. As if to give weight again to

their ideas regarding the antiquity of the Hindu era, its cycles have been elaborated into a system of *yugas*, which carry us back to ages quite sufficiently remote to satisfy the most ardent votary of the geologic theory.

Nor if we pursue the enquiry in the opposite direction, do we find greater encouragement for the reception of a change of alphabets. We cannot trace the Koran to its origin, for it was not created. The doctrine is one of the most noted heresies of Islamism. The *Koran* is co-existent and co-eternal with the Supreme Being, written in the Arabic characters on the *lawh i Mahfúz*, or sacred tablet, which is guarded by the angel Gabriel. As regards the Koran, moreover, an especial virtue is inherent not only in the words of the text; but in the actual letters in which they are written, for the *book* would not be the Koran, if transcribed in any others.

To obtain sympathy or support, then, from the *learned* in India, for any system that proposes the *general* substitution of a foreign alphabet for those they have been led to consider as sacred, I look upon as impossible. But were it possible, the difficulty of inducing any people to accept a new alphabet for the purposes of ordinary reading and writing, when they have one which they have used for centuries, which is already familiar to them, and which they find to answer all the purposes of life, is of itself of sufficient magnitude, to render it unwise in the advocates for so great a revolution, to encounter any obstacles that might be avoided. As an illustration of this minor difficulty, I may instance the Greek, the German, and the Russian alphabets, all of which still exist in certain portions of Europe, to the exclusion of the Roman alphabet, which has been adopted in all other countries. Some years ago indeed it was proposed to the Greeks to adopt the Roman characters; but the patriarchs rejected the idea with scorn. In Germany it has frequently, I believe, been attempted to introduce the Roman letters more generally, but except in books intended for exportation, the change does not appear to have found favour, and it is a singularly apt illustration of this difficulty, that the very articles in which Dr. Sprenger has so ably advocated the universal adaptation of Roman alphabet to Oriental languages, are printed in the old and familiar German type. Now the difference between the German and the Roman characters is comparatively trifling, and as the powers of the letters are precisely the same, for all practical purposes, the one alphabet

may be considered as good as the other. That the old alphabet then retains its hold on the Germans, furnishes us, in my opinion, with a strong proof of the very great tenacity with which a people will cling to an alphabet, when it has been so widely adopted as to have become familiar to their whole nation. Indeed, if experience is a guide, it would appear easier to change a language, than to change an alphabet.

These difficulties, however, it may be urged are, more or less, connected with the weaknesses of human nature, and may be traced to bigotry, vanity, prejudice, force of habit, false ideas of nationality, &c., all of which might be overcome by a ruling power occupying the position of the English in India; and this is in a great measure true; but admitting its truth, the most important part of the enquiry—indeed, I may say, the whole of the enquiry, will still remain, viz. the suitability of the characters of the Roman alphabet, to represent the sounds to be expressed in all the languages, both living and dead, which are in use in India. I have read a great deal that has been written on the subject, and I must confess that I have never seen this portion of it thoroughly well investigated Indeed it is far more often settled in a very summary and off-hand manner, by a reference to some system which has already been adopted, and which has been used, it is advanced, with great success. Yet it is of the essence of the enquiry, and until it is satisfactorily disposed of, it is quite needless to refer to the many advantages that would result from the adoption of a universal alphabet, a point which I assume nobody will care to deny. Nor does the fact of a certain currency being obtained for books printed in a particular type prove what is wanting. Many people thought that putting pantaloons on Hindustanis would make English soldiers of sepoys; but it did not do so, a fact which the English discovered to their cost in 1857. After wearing them, father, son, and grandson for a whole century, on the very first favourable opportunity, they tore them off, and cast them away. And why, may I ask, did they do so? Because they found them not so suitable to their habits and customs, and the climate of their country, as the *dhotis* they had been in the habit of wearing for ages. The educated Bengalis have for a quarter of a century been familiar not only with the alphabet we use, but with the language we speak. They speak it and write it infinitely better than they do their own language, yet we do not find that when they write Bengali, they use this or any other

than the Bengali alphabet. How it would be, if the language and the Roman alphabet were familiarized, if I may use the expression, I cannot say; a great many Bengalis now wear pantaloons, but in the matter of the alphabets experience, as at present available, is not certainly encouraging to a change.

It is surely not unnatural, that a people, after labouring for centuries to compass an important end, to invent and elaborate a system of signs and combinations of signs, and to apply them to every sound in their language, and having accomplished it, should be unwilling to resign that which had cost them so much time and trouble. The Deva Nagari alphabet, if it is the most elaborate, is also the most perfect alphabet in the world. It was modelled and improved from the Pali or most ancient Indian alphabet expressly for the Sanskrit language; it was fashioned for this language; it was made to fit it, and therefore it does fit it better than any other; and it is a singular coincidence, that this fact attracted the attention of, and was noticed by the very remarkable Chinese traveller, Houen-thsang, upwards of 1000 years ago, and from his memoires, I make the following extract:—"Les caractéres de l'écriture ont été inventés par le dieu Fan, (Bramâ) et, depuis l'origine, leur forme s'est transmise de siècle en siècle. Elle se compose de quarante-sept signes, qui s'assemblent et se combinent suivant l'objèt ou la chose qu'on veut exprimer. Elle s'est répandue et s'est divisée en diverses branches. Sa source s'étant élargie par degrés, elle s'est accommodée aux usages des pays et aux besoins des hommes, et n'a éprouvé que de légères modifications. En général, elle ne s'est pas sensiblement écartée de son origine C'est surtout dans l'Inde centrale qu'elle est nette et correcte."

It is unnecessary to go into a comparative analysis of the two alphabets to establish the truth of these remarks. The coat that is made for a man is likely to fit him better, than the coat that is made for somebody else, and this, it appears to me is, if not the whole question, certainly the major part of it. "Yet" it will be urged by progressists, "fashions may change, and it would be unjust and a hardship, to condemn an ancient friend always to appear in his antique costume, because it had once, when in fashion, been made to fit him." I answer, that if it becomes him better than any other, it would be a far greater hardship, to make him change it to suit the taste or to please the eye of foreigners; but even if he agreed to put on a new

coat, you would still be obliged to make one to fit him, and herein lies a very great difficulty." I consider it to be a fundamental principle of the art of palæography, that the power of each symbol should be so determined that its euphonic value in all combinations of symbols shall be fixed and not variable, as is the case with the Roman alphabet, as it has been adapted to English and some other modern tongues; that these values should be readily ascertainable, and that, as far as possible, distinct phonetic values should be represented by distinct symbols and combinations of symbols, and the same always by the same, wherever they occur. Now if we investigate the history of the progressive development of alphabets, we will find that while these rules have been steadily kept in view in the adaptation and modification of alphabets in the East, they have been systematically set aside in most modern languages of the West; and the result is, that while an educated Eastern gentleman, seldom or never makes a mistake in orthography, few Englishmen or Frenchmen can trust themselves to write their own language without a pocket dictionary at their elbow. There are again numerous letters in the Deva Nagari alphabet, for which we have no corresponding signs in the Roman alphabet, and many sounds in the former language of which no combination of the letters of this alphabet will convey to the ear even an approximate idea. And the same may be said of all the alphabets and languages derived from this source, and also, though in a less degree, of the Arabic and Hebrew alphabets. All attempts to express certain letters in the Arabic alphabet in Roman characters have failed, and for obvious reasons all future attempts will fail likewise. In short, if it be proposed to make the alphabet of any one language the basis of an alphabet for another language, its capabilities and powers must first be carefully examined with reference to the requirements of that language, and its redundancies eliminated, or its deficiencies supplied, as the case may require. This was the course adopted by the Brahmans in regard to the primitive alphabet of India, in the second and third century B. C., and this was the course adopted by the learned Lepsius in the 19th century A. D. when propounding his scheme for a missionary alphabet. He did not set up the doctrine that *any* existing alphabet, much less the Roman alphabet with its twenty-six letters, was perfect, in the universal application of the term. He assumed rather the converse, and the plan he adopted was as follows:—

Having first arranged all the sounds prevailing in the known languages of the world, to these he applied the characters of the Roman alphabet as far as they would go, and for those sounds for which he could not find corresponding signs in the Roman alphabet, he indented on other alphabets, or invented new ones, adapting thus his alphabet to his languages, not *vice versâ*.

But if no existing alphabet is so perfect as to be made applicable to all existing languages, speaking generally, the alphabets of most languages which have received such a development as to entitle them to take rank as literary languages, and all those which may be distinguished as classical, have been so far perfected in relation to these languages themselves, and their symbols and sounds have become so closely identified, that any attempt now to dissever the one from the other, especially in the case of dead languages, would result in very serious consequences—indeed consequences so serious, in my opinion, as to give grounds for alarm, lest the true phonetic values of the original letters should soon become irremediably confused, and in the revolution of epochs, the languages themselves might be lost. This is a view of the case that will perhaps be disputed, yet it is one which will, I am sure, be clearly intelligible to all who have occupied themselves with decyphering ancient inscriptions, and are consequently aware of the stumbling block those inscriptions prove to archæologists, and numismatists, in which a language, foreign to the transcriber, has been rendered by the ear, in a character equally foreign to the language in which it is written.

I venture to consider it proven then, that the Roman or any other modern alphabet, cannot be applied to any of the dead or living languages of India for which an alphabet has been already perfected, with advantage to those languages, and that any attempt to do so, except in so far as the transcription may suit the convenience of foreigners and ripe scholars, would only lead to very great confusion.

It remains, however, to enquire whether, setting aside those languages, and *patois*, which have not been reduced to writing, we have no languages which have received a considerable development, but for which no written character, original or adapted, has been perfected. And here our attention is at once arrested by a language which is somewhat peculiar in its characteristic—a language which is written in many characters, yet which has no alphabet of its own; which has an ex-

tensive vocabulary; yet few words in that vocabulary can be said to belong to it; which is at once the most widely spread, the most popular, and the most useful of the languages of India, yet of which there is no definite form or dialect that can properly be called a language of any part of India; which cannot be developed without losing its identity, and yet which wanting, as it is, in all these, the attributes of a perfect language, has a grammatical structure which is essentially its own, and which it carries with it into whatever other language it may be merged. The language I allude to, is that which is commonly called Hindustani. It is the *lingua franca* of Hindustan, and is so universally familiar, that many I dare say will say that my remarks are paradoxical, and some that they are absurd. I venture to think that they are neither the one nor the other. But, as few will feel disposed to accept my simple word for the fact, I beg to offer the following explanation. The Hindustani language, as now existing, can hardly be called an independent language,—a language which springing from an original and ancient source, has existed, first in a primitive and rude form, and by a gradual and progressive development, always preserving its original basis, has finally received a polish, and been imbued with an elasticity, such as to make it a suitable medium for the expression of complex ideas. It cannot be said to belong to the Aryan; it certainly does not belong to the Semitic; it does not belong to the Scythian family of languages. It is a language, the elements of which are drawn from all these sources. The basis, that is the grammatical structure of Hindustani, if ever it was Sanskrit, is now so distinct from it, as to possess quite a character of its own, and its vocabulary is made up from languages both of the Aryan, Scythic, and Semitic families. It is so far then a composite language, but inasmuch as languages of distinct and separate origin will not readily mix, the moment any attempt at attaining a high degree of development is made, a conflict of elements takes place, which generally ends in the complete overthrow of one and the merging of what is called simple Hindustani into languages which, while they preserve in a great degree their Indian structure, indent for their vocabulary either on languages purely of Aryan, or purely of Semitic origin. This conflict is mainly attributable to the cause here assigned, the hostility of the primitive elements, and possibly of the races, but there can be little doubt that it is greatly fostered and encouraged by the maintenance of a double alphabet, and

the difficulties of fusing these opposite elements, into a composite language, in the ordinary acceptation of the words, would be considerably diminished if an alphabet could be invented that would be common to both.

The Deva Nagari alphabet is quite as unsuitable for expressing Arabic and Persian words, as the Greek alphabet is unsuitable for expressing Sanskrit words pure and derivative, and the language as now written, presents as *bizarre* and *outré* an appearance, as if a language composed of English, German, and Russian words, was written in Hebrew characters. In most composite languages, such as English or the Romance languges, the whole forms an amalgam in which sometimes, the original materials can be recognized with difficulty, and often not at all, as all will be aware who have read Dean Trench's works on the English language. But in Hindustani it is different, the materials, particularly those of Semitic origin, remain exactly as they were, and it is the same with modern Persian in regard to its Arabic words, which Sir William Jones has well illustrated in the following passage. "This must appear strange to an European reader; but he may form some idea of this uncommon mixture, when he is told that the two Asiatic languages are not always mixed like the words of Roman and *Saxon* origin in this period, 'The true law is right reason, conformable to the nature of things, which calls us to duty by commanding, deters us from sin by forbidding;' but as we may suppose the Latin and English to be connected in the following sentence: "The true *lex* is *recta ratio*, conformable *naturæ rerum*, which by commanding *vocet ad officium*, by forbidding *à fraude deterreat*." But the difference in the case of Persian is, that it and Arabic have a common alphabet while the two languages of which Hindustani is chiefly composed, have separate and distinct alphabets.

The obstacles again to fusion under present circumstances are greatly increased by distinctions of race and creed. Without entering into nice ethnological distinctions, it will be sufficient to consider that we have in India two great classes to deal with, Hindus and Musalmans. The former, in writing Hindustani, use the Deva-Nagari, or one of its derivative alphabets; the latter generally use the *Nas Táliq* or Persian character. Neither know the characters in which the others write, and as the races are prevented by religious differences from intermixing, there is neither inducement nor necessity

for improving their acquaintance with each other's customs in this respect. When letters pass between two educated gentlemen of different race and creed in India, though written in what may be called the mother-tongue of both, they must be taken to the village scribe to be read. This certainly is an anomaly—an anomaly which does not exist perhaps in any other part of the world. But we have not yet reached the end; we are introducing railways, telegraphs, and all kinds of mechanical power into India, and we are teaching sciences bristling with technical terms. A medical student who may be unable to speak a word of English, will glibly run over half the Latin terms in the pharmacopœia of medical science, and any ordinary native gardener will give the Latin botanical name for every tree and flower in a well-stocked garden. We have here, then, not an alphabet seeking for a language; we have a language seeking for an alphabet. It has greater natural claims perhaps on the Deva Nagari alphabet than upon any other, because the language, in its ancient dialectic form must have been closely allied to the Sanskrit, and the present Deva Nagari alphabet was formed from the Indian alphabet; but certain portions of the frame-work of the language are so distinct as to be deduced with difficulty from Sanskrit, and if English, Sanskrit, Arabic, and Persian words are to be adopted into the language, and one of the three alphabets is to be selected to be a common alphabet for all races who use this language throughout the country, the balance, on many grounds, is in favour of that alphabet which is used by the most highly civilized people—the ruling power.

Certainly very great difficulty would attend the inaugural measures of a comprehensive change of the kind; but these I need not discuss here, further than to add that any attempt to accomplish so great an end, must be made gradually, and with much caution.

But besides Hindustani, it must be borne in mind, that there is a very wide field that the Roman alphabet may occupy at once. I allude to the very numerous dialects which we find in all parts of India to which the civilization of the Budhists and Brahmins have not penetrated. In the province of Assam and neighbouring districts, we have eight different dialects which, are stated to be distinct languages,* having no affinity with one another.

* 1. Garow.
2. Naga.
3. Booteah.
4. Khassiah.
5. Abor.
6. Mishmee.
7. Kamptee.
8. Mikir.

This is probably a mistake; but these languages are still so distinct as to be a bar to intelligible inter-communication. In addition to these, there are numerous dialects, presenting, for the most part, the characteristics of the central-Asia type of languages; but all differing from each other in a greater or less degree, and almost all not yet reduced to writing. The same remarks are applicable to Birmah proper, British Birmah, Pegu, the Tenasserim Provinces, Chittagong and Akyab.

The great majority of the languages here alluded to, having no affinity with Sanskrit, the Deva Nagari alphabet cannot be said to have any peculiar claims on them. The Missionaries on the North East frontier have adopted the Roman characters in their teachings, while the Missionaries on the South East frontier have adopted the Burmese characters. Now, much may be said against teaching uncivilized tribes a character that will not enable them to carry on business relations in writing with their neighbours; but if it is ever intended to apply the Roman alphabets to *any* of the languages of India, the best languages certainly on which to experimentalize, are those to which no alphabet has yet been naturalized.

The Missionaries in British Birmah are making very rapid progress with the instruction in Burmese and the conversion to Christianity of the Karens, and the Welsh Presbyterian Mission at Cherrapoonjee are printing some books and a dictionary in the Roman characters. The Education Department in Assam first adopted the books of the Missionaries, but have discarded them, I believe, for books printed in Bengali type. The question therefore ought to be authoritatively settled, or we shall see, what it must be confessed is not uncommon in India, one generation taking infinite pains to do that which the next will take equal pains to undo.

The conclusions then at which I have arrived are, that any attempt to adopt the Roman alphabet to the classical languages of India would be mischievous; and that all those languages for which an alphabet has already been perfected by the people speaking them, have no need of such a change; but that an attempt might be made to adopt this alphabet, or a modification of it, to all Indian languages which at present have no alphabet which can properly be called their own.

On the Buddhist Remains of Sultánganj.—*By Bábu* Rájendralála Mitra.

Ascending the Ganges from Bhágalpur, the first object of interest which arrests the attention of the traveller is a singular mass of granite towering abruptly to the height of about a hundred feet from the bed of the river. Its natural beauty and romantic situation have long since dedicated it to the service of religion; and Jangirah, the name of the rock in question, has been associated with many a tale of love and arms. It stands at a distance of about a hundred yards from the right bank immediately opposite to the mart of Sultánganj, and is surmounted by a small stone temple which is visible from a great distance, and serves as a beacon tower to the mariner. The presiding deity of the sanctuary is named Gaibinátha, a form of S'iva whose identity I cannot ascertain. Along with him are associated a number of statues and images whom the resident priests hold in such slender respect that they did not object to my scratching some of them with a penknife to ascertain the nature of the stones of which they are made.

The temple bears no inscription, and the attendant Brahmans could not give me any information regarding its history. Judging, however, from its make and appearance, I believe it cannot be more than two or three centuries old. Around it are situated a few low rooms for the accommodation of the priests.

The face of the rock is covered by a number of bassi-relievi, most of which are Hindu and include representations of Ganes'a, Hanumána, Krishṇa, Rádhá, Vámana, Ananta sleeping on a snake, S'iva and other Pauraṇic divinities. But there are a few which are decidedly of Buddhist and Jain origin. The Buddhist figures, mostly Buddha in the meditative posture, occupy more centrical positions than the Hindu ones and appear to be more worn away than the latter; both circumstances affording conclusive evidence of the place having been originally a Buddhist sanctuary which the Brahmans have appropriated to themselves since the downfall of Buddhism. A Jain temple still exists on one side of the rock to which a few pilgrims occasionally come to offer their adoration to Páras'wanátha the 23rd teacher of the sect.

There is only one place at the foot of the rock at which a boat can be put in where there is a landing-place, and thence a very steep and winding path leads to the summit.

According to Montgomery Martin, at the three sacred full moons, in October, January and April, (Bengali Kártika, Mágha and Vaisákha,) from twenty to thirty thousand persons attend to bathe at this place; "but the great emolument of the priests arises from about 50,000 pilgrims who at various times come to carry away a load of water which they intend to pour on the head of various celebrated images in distant parts. In the south of India I have met pilgrims carrying their load from this place; but by far the greater part goes to Devaghar in Virabhum where it is poured on the Priapus or Linga called Baidyanátha, to whom this water, taken from a scene of former pleasure, is considered as peculiarly acceptable."*

To the east of this rock on the river bank there is another mass of granite having a few carvings on its western face, and a brick-built mosque on the top of it called the *Dargah of Baishkaran.*

The village of Sultanganj stretches westward to the extent of about a mile from the foot of this rock. In a line with Jangirah, the position of the village is Lat. 25° 19′ 20″ N.; Long. 86° 48′ 25″ E. At the time of Mr. Martin's survey, forty years ago, it contained about 250 houses, of which only two were brick-built and three tiled. The number of houses has now quintupled, and the main road in front of the mart which gives name to this place, is lined by a good many pucka godowns.

The railway station of Sultánganj stands behind this mart and at a distance of about half a mile to the south of it.

The space between the mart and the railway station forms a quadrangle of 1,200 feet by 800. It seems never to have been under much cultivation, and is covered by the debris of old buildings, the foundations of which have lately been excavated for ballast for the railway. The trenches opened along the line of the foundations are not continuous, and in several places have been filled up, but from what remains I am disposed to believe that the place was at one time divided into courtyards having lines of small cells or cloisters on all four sides. This idea has been strengthened by the discovery of a series of six chambers in a line at the south-western corner of the

* Martin's Eastern India, Vol. II. p. 38.

quadrangle. These chambers form a part of the western side of a large courtyard on the north of which Mr. Harris, Resident Engineer, East Indian Railway, under whose superintendence the excavations under notice have been carried on, has brought to light the foundations of two similar chambers. The southern and the eastern façades yet remain unexplored. But the accumulation of rubbish on those sides, rising to the height of 10 to 20 feet, clearly indicates that chambers corresponding to those on the west and north are to be met with under it.

At the middle of this long ridge of rubbish Mr. Harris has found the foundation and the side pillars of a large gateway which was evidently one of the principal entrances to the quadrangle. Similar gateways probably once existed on the other three sides, but their vestiges are no longer traceable.

The accumulation of rubbish at the south-east corner is greater than any where else, and on it is situated the bungalow of the Resident Engineer. It would be well if a shaft could be run through this mound, as it is here that relics of importance are most likely to be met with.

The chambers excavated at the south-western side are not all of the same dimensions. They measure within the walls from $12' \times 10'\ 6''$ to $14' \times 12'$. The depth from the top of the plinth to the lowest part of the foundation (the only portion now in situ) is 13 feet. This depth was found full of earth and rubbish, but divided at intervals of 3 or 4 feet by three distinct floors formed of concrete and stucco. The lowest shews no trace of plaster. The upper floors had openings or hatchways through which people descended to the bottom, and used the different stories as cellars or store-rooms. No valuable property or remains of corn or other goods have, however, been traced in these cellars, as most probably they had been removed before the monastery fell into the hands of the destroyer.

The interior of the walls had never been plastered, but the front, facing the courtyard, has a thick coating of sand and stucco such as are to be seen in modern Indian houses.

The bricks used in the building of these chambers measure $13'' \times 9'' \times 2\frac{1}{2}''$, and in density, colour and appearance are similar to those employed in the construction of the great temple at Buddhagayá. At Sánchi, Sárnáth and other old Buddhist remains, bricks of such large size appear to have been common, and they give a pretty close

idea of the era when they were most in use. The largest bricks known are met with in the ruins of Hastinápur, which, according to Mauluvi Syad Ahmad,* measure 20 inches long, 10 broad and 2½ thick. If they be, as has been supposed, synchronous with the heroes of the Mahábhárata they are the oldest as well as the largest known. The next in size are those from the walls of Babylon, for which the clay thrown out of the trenches surrounding the city supplied the material; they measure sixteen inches square, with a thickness of three inches. The next are those from the pyramid of Howara in Egypt. They measure 17½ inches by 8¾ inches; the thickness being 5½ inches. Next to them are those of Buddhagayá, Sárnáth, Sultánganj and other Buddhist localities; they vary from 13″ to 14″ by 8″ to 10 inches, the thickness ranging from 2½ to 3½. This kind of brick, was in use for upwards of seven hundred years down to the fifth or sixth century of the Christian era. The bricks of the Hindu Rajas of Lilput, Avangpur, Luckerpoor are much of the same size, but of very different appearance. The early Pathans also used very large bricks, and in old Delhi they are very common. The later Pathans reduced the size of their bricks to 12 inches, and in the days of the Moguls they were further reduced to 10″, hence it is that in the many palatial buildings of Akbar, Jehangir and Shah Jehan, the greatest builders of the race, we find no trace of a single large brick.

Beyond the western wall of the chambers there is the foundation of another and a broad one, which formed the boundary wall of the quadrangle. It runs due north and south and is joined by one which runs along the ridge on the southern side. Similar boundary walls, no doubt, once existed on the north and the east, but their traces have long since been effaced.

In front of the chambers there are to be seen the remains of a hall or verandah which formerly formed the most important part of the building on this side of the quadrangle. Its floor is on a level with the highest floor of the chambers, and seems to have been made of concrete and stucco, and painted over in fresco of a light ocherous colour. How it was enclosed in front has not been made out. Probably there was a range of square pillars, forming a verandah or pillared hall resembling a modern Bengal *dalan* or the *choultry* of Southern India. The floor of the courtyard has not yet been laid bare, but judging from

* Journal of the Archæological Society of Delhi, p. 50.

the position of a water-course formed of scooped flags of granite which runs under the floor of the hall and through one of the partition walls of the chambers to a drain beyond the boundary wall of the quadrangle, and which was evidently intended to carry off its drainage I am induced to believe that it stood about 3 feet lower than the hall. Similar water-pipes of granite have been met with at Buddhagayá, Sárnáth and elsewhere.

Of the relics which have been collected by Mr. Harris in course of his excavations at this place, the most important appears to be a colossal figure of Buddha which was found lying on a side of the hall described above. It had evidently been knocked down by some iconoclast before the destruction of the hall, and removed several feet away from its pedestal. The latter too had been tilted over, but not much removed from the centre of the hall which was its original position. It was formed of a slab of granite 6′—11″ × 3′—9″ the thickness being 9½ inches. The statue was secured to this stone by two bolts, the remains of which are still visible. The statue is of copper and seems to have suffered no injury from the hands of the destroyer, except the mutilation of the left foot across the ankle.

Its dimensions are—

From the topknot on the crown of the head, along the back to the edge of the heel,	7	3
From do. along the front to the sole of the foot under the instep,	7	6
Round the head,	2	0
Topknot,	0	3
From bottom of topknot to forehead,	0	2⅛
Length of face from forehead to chin,	0	10
From chin down to wais.,	2	0
From waist to sole of foot,	4	0
Round the breast,	6	7
Across the shoulders,	2	4
From shoulder-joint to elbow,	1	6
From elbow to wrist,	1	0
From wrist to end of middle finger,	1	0
Foot from heel to end of 2nd toe,	1	½

The above measurements were taken with a common tape without any reference to the principles followed by artists in the calculation

of the relative proportion of the different parts of the human figure. They disclose, however, some curious facts: thus omitting the top-knot formed of a collection of hair on the crown of the head, we find that the total length of the figure (7 feet) is to the head (12⅛ inches,)—as 1 to 6 and $\frac{7}{9}^{0}_{7}$, or in the language of artists 6 heads, 3 parts, 9 minutes, instead of the usual standard of 1 to 8, and also considerably under that of the antique statues. In the Hercules the Apollo and the Laocoon the length of the body varies from 7 heads, 2 parts, 3 minutes to 7 heads, 3 parts, 7 minutes. The tallest statue known is that of Mirmillo, and it measures 8 heads only. The length of the fathom again, which in Europe is reckoned to be the same as the height, is in our statue fully one-third more. This is owing no doubt to the belief common in India that the simian peculiarity of the hands reaching down to the knees is an emblem of divinity and universal sovereignty. It is worthy of note, however, that in a table published by Dr. Emil Schlagintweit in his recent work on Tibetan Buddhism,* the fathom of Brahmans of Upper India, is represented to be greater than the length of their body, and the Bhots have the same peculiarity in a greater degree. It is remarkable also that the latter make their Buddhas and Bodhisatvas have shorter fathoms than their genii and dragsheds. The increase in the fathom is effected by an inordinate prolongation of the hands, leaving the arm and forearm less than their natural proportions as compared to those of Indian Brahmans, of Bhots, and of Bhotanese idols; but somewhat longer than the European standard of 1 head, 2 parts and 3 minutes to the arm and 1 head, 1 part and 2 minutes to the forearm. The foot, according to modern artists, should

* I take the following from Dr. Schlagintweit's book to bring to one view the relative proportions of the different parts of the human figure compared with those of Bhot statues. The second column A has been added by me.

	A. Buddha from Sultanganj.	B. Brahmans of Upper India.	C. Bhots.	D. Buddhas, Bodhi-Sattvas, of Tibet.	E. Dragsheds, Genii, Lamas, of Tibet.
Total height, ...	1.000	1.000	1.000	1.000	1.000
Head, ...	0.119	0.145	0.149	0.166	0.160
Periphery round the forehead,	0.285	0.322	0.345	0.350	0.420
Length of Fathom, ...	1.342	1.025	1.069	1.080	1.117
Ditto Arm, ...	0.214	0.433	0.451	0.449	0.430
Ditto Forearm, ...	0.142	0.165	0.164	0.149	0.155
Ditto Hand, ...	0.142	0.107	0.110	0.110	0.110
Ditto Foot, ...	0.148	0.144	0.145	0.140	0.144

be one-sixth of the body, but in the statue this has been exceeded by a few minutes. The torso is slightly shorter than the Grecian standard. On the whole, even after making ample allowances for the fact that the changes which the human form undergoes from infancy to old age and in different nationalities and climates preclude the possibility of limiting its measurements to any ideal standard, it must be admitted that the artist of the statue had a very imperfect knowledge of proportion. He had evidently adopted the tall North Indian and not the squat Bhot for his model.

The figure is erect, standing in the attitude of delivering a lecture, and in this respect bears a close resemblance to the sandstone statues so largely found at Sarnath by General Cunningham. The right hand is lifted in the act of exhortation; the left holds the hem of a large sheet of cloth which is loosely thrown over the body. Both hands bear the impress of a lotus, the emblem, according to Indian chiromancy, of universal supremacy, and as such is always met with on the hands of Vishṇu, Brahmá and some other Hindu divinities. The ears are pendulous and bored, and the hair on the head disposed in curled buttons in the way they are usually represented on Burmese figures, and not very unlike the buttons on the heads of some of the Nineveh bas-reliefs. The lips are thin and the face, though more rounded than oval, is not remarkable for any prominence of the cheek bone. On the forehead there is a circular *tilak* or auspicious mark.

The material is a very pure copper cast in two layers, the inner one in segments on an earthen mould, and held together by iron bands which were originally $\frac{3}{4}$ of an inch thick, but are now very much worn down by rust. The outer layer of the copper has also oxidized in different places and become quite spongy. The casting of the face down to the breast, was effected in one piece; the lower parts down to the knee in another, and then the legs, feet, hands and back in several pieces. A hole has been bored through the breast, and chips have been knocked off from other parts of the body since the exhumation of the figure, evidently with a view to ascertain if it did not contain hidden treasure such as is said to have been found by Mahmood in the belly of the famous idol of Somnáth, but it has led to the discovery of nothing beyond the mould on which the figure had been cast. The substance of this mould looks like a friable cinder. Originally it consisted of a mixture of sand, clay, charcoal and paddy husk,

of the last of which traces are still visible under the microscope. Bábu Kánailáia De, Assistant Professor of Chemistry, Medical College, who kindly undertook to analyse this black stuff for me, says that it consists of—

Silica,	73	50
Oxide of copper, peroxide of iron, alumina, lime, and magnesia,	18	0
Organic matter and moisture,	8	50
	100	00

On the annexed plate, which has been drawn from a photograph, the statue is represented with two small figures on its sides. These were found close by it in the chapel hall. They measure 1′-10½″ and 1′-5″ inches high respectively. They are carved in basalt and, in style and attitude, bear a very close resemblance to the copper statue; but they have each an attendant devotee kneeling before it with folded hands, and the Buddhist creed "*Ye dharmáhetu*" *&c.*, engraved in the Gupta character on the pedestal. The small one has the same also on the back.

Among the other relics found I may mention—

1. A mutilated terra cotta figure similar to the above.
2. A large conch shell (sankh), its animal matter nearly all destroyed.
3. A great number of cowries not much affected by time.
4. A piece of elephant bone—the top of the tibia sawn both across and longitudinally, the sawing mark most distinctly visible.
5. A slip of ivory about a foot long and an inch broad; flat but not sharp: edged.
6. An Iron axe destroyed by rust, but the shape is distinct.
7. Ditto smaller.
8. Ditto very much destroyed; the ring broken off.
9. An Iron ring about three inches in diameter with a spike on one side, very much destroyed by rust.
10. A chisel with an iron handle, very rusty.
11. A copper disk or cover destroyed by rust.
12. Sitting figure of Buddha in copper, partially destroyed by rust.
13. Three standing figures in do. do.; the heads had halo which were found broken and detached.
14. The hand of a large copper figure.
15. A number of broken bits of rusty copper domestic utensils.
16. Lumps of copper ore.

17. A miniature copper bell.

18. A fragment of a crucible.

19. Lumps of clay of the same composition as the crucible.

20. Fragments of enamelled earthenware; black and variegated patterns.

21. A miniature teapot, broken;—vessel about an inch and a quarter, with a spout.

22. Miniature terra cotta chaityas, containing within the seals of the Buddhist creed, some having seals stamped on the bottom.

23. Ditto having the figure of nine chaityas stamped on its sides and of seals at the base.

24. Several of the above seals detached.

25. Balls of earth pear-shaped and perforated.

26. Cylinders of do.; both probably intended for nets, to make them sink fast.

27. A number of pebbles.

28. Fragments of red ocherous rock.

29. A number of terra cotta lamps, circular, flat-bottomed, the spout not very projecting.

30. Handles of terra cotta frying-pans.

31. Fragments of handles, spouts and covers of earthenware vessels much stronger than ordinary.

32. Ditto of terra cotta basso-relievo figures, red-glazed.

33. Head of Vishnu in baked clay, seasoned with paddy and glazed in red, with the seven-headed cobra over head (the only Hindu relic met with).

34. Well formed heads of *surki* cement plastered with stucco, one with a particularly beautiful profile.

35. Hands and feet of do.

36. Fragment of a tile with basso-relievo figures of palms.

37. A bit of crystal.

38. A round hollow piece of iron covered with copper gilt and stamped with the figure of a chaitya on each side.

39. Fragments of encaustic tiles.

40. Fragments of white stucco coloured red in fresco from the floor under the great copper statue.

41. Fragments of cylinders, red-glazed.

42. Fragments of terra cotta ornaments.

43. A number of bivalve shells.

44. Lamps of stone, similar in shape to No. 29.

The articles named above leave no doubt as to the nature of the building in which they have been found. The quadrangle was evidently a large Buddhist monastery or *Vihára*, such as at one time existed at Sárnath, Sánchi, Buddhagayá, Manikyálá and other places of note, and at its four corners had four chapels for the use of the resident monks. Two of these which abutted on the mart have already disappeared, and of the other two, that on the south-west has yielded the relics noted above, and the last remains under the railway bungalow, a most promising field for the antiquary who could devote a week or two to its exploration.

Of the history of this Vihára nothing is now traceable. From its extent and the style of its construction, it is evident that at one time it was a place of great repute, and the resort of innumerable pilgrims. But its glory set a long while ago, and even the name of the place where it stood is now lost in obscurity. The present appellation (Sultánganj) is quite modern, not more than two or three centuries old, and is due to a prince of the house of Akbar. Fa Hian makes no mention of it, and Heuen-Thsang talks of the ruins of several large monasteries in the neighbourhood of Bhagulpore, but gives us no clue to the one under notice. It is to be presumed therefore that it had been ruined and forsaken, or at least had fallen into decay, before the advent of the latter Chinese traveller. The inscriptions on the minor figures, in the Gupta character of the 3rd and 4th century, shew that the Vihara with its chief *lares* and *penates* had been established a considerable period before that time, probably at the beginning of the Christian era or even earlier, for Champa (modern Bhagulpore,) was a place of great antiquity and the Buddhist took possession of it very early as the capital of Eastern India, and established many Viháras and chaityas in and about it. Though most of these have been destroyed by the ravages of time and the ruthless hands of adverse sectarians, there still stand in its vicinity two round towers, each about seventy feet high, the names of whose founders and the object for which they had been built have long since been forgotten, but which from their close resemblance to the *pyrethra* so common in Affghanistan and elsewhere, are evidently Buddhist monuments of yore.

Though the principal residents of Buddhist monasteries were priests

who were sworn to celibacy and poverty, who shaved their heads, wore the simplest garments, and earned their subsistence by alms, still the Viháras of old were not without the possession of considerable wealth, and the proximity of a mud fort was always deemed a desirable source of security. Hence it is that large mounds, the remains of former mud forts, are generally met with in the neighbourhood of extensive monasteries. At Sárnáth a fort stood within five hundred yards of the Vihára, at Buddhagayá one was situated within a stone's throw of the great temple, and at Kusia and elsewhere the like may be seen within very short distances. It was to be expected therefore that at Sultánganj there should be a fort within hail of the monastery, and accordingly we find one to the west of it at a distance of about three quarters of a mile—a square mound of about 400 yards on each side raised to the height of about 20 feet from the plain, and now the site of an indigo factory. To the south of it there is a large tank which yielded the earth of which the mound was formed.

Another peculiarity in which the Vihára at Sultánganj bears a close resemblance to Buddhist monasteries in other parts of India, is the great abundance of the little fictile bell-shaped structures called *chaityas*. They occur either in alto-relievos as No. 22, or in bass-reliefs stamped on small tiles, as No. 23. The former generally have the Buddhist creed enclosed within or stamped at bottom, and the latter the same stamped below the figure of the Chaitya. The type seems to have been conventional and common all over India. Mr. E. Thomas found the exact counterparts of these at Sárnáth, General Cunningham noticed them at Bhilsa, and I have seen some brought from the ruins of Brahmanabad in Guzerat and now in the possession of Lady Frere. A short time ago Colonel Phayre sent a few tiles to the Asiatic Society from Burmah which, though shaped differently, and intended to hold the figure of Buddha in the centre, have the chaityas and the inscriptions so exactly alike that they may easily pass for relics from Sárnáth or Sultánganj. The inscriptions on all these are in the Kuṭila type which had a long range of four centuries from the 8th to the 11th; the monuments on which they are found, must have therefore existed at least down to the 7th, 8th or even the 9th or 10th century. The Kuṭila characters, however, could not have been current in some of the countries where they are met with, such as Burmah and Guzerat, and must have therefore been adopted as mystic or sacred

symbols in these places. It is remarkable at the same time that while the characters remained intact the "creed" failed to withstand the change of climate, and underwent several alterations of reading.

These structures are models or miniature representations of sepulchral monuments, and they owe their origin to an injunction in the Bhuddhist scriptures which recommends the dedication of such monuments as an act of great religious merit. Hence they have engaged the earnest attention of the followers of Gautama from an early age, and many are the ruins in India which now attest the lavish expenditure which some of its former kings and princes incurred in raising them in a manner worthy of their ambition.

They were originally hemispherical in shape and of stupendous size, rising directly from the surface of the earth like a bubble on water, and typical of the evanescent character of all worldly objects.* They are represented by the topes of Sánchi and Sátdhará, which, according to General Cunningham, date as early as the 6th century before Christ, but which certainly must have existed since the fifth. Two hundred years subsequently, about the time of the third synod, the hemispheres were raised on cylindrical plinths of small height as in the chaityas around Bhilsa. Gradually the plinths were raised higher and higher, until, in the beginning of the Christian era, their altitude became equal to the diameter of the hemisphere, as at Sárnáth near Benares and in the topes of Affghanistan; and ultimately they merged into tall round towers surmounted by a dome, or bell-shaped structures with elongated pinnacles, such as the Dehgopas of Burmah or the bass-reliefs on the clay figure under notice. These were costly edifices and could be constructed only by the wealthy. But as the merit of dedicating them was not dependent upon their size, men of moderate means satisfied their religious craving by the consecration of small stone models which the clergy assured them would secure to them as much merit as the lordly structures would to their princely donors. They added that vows to dedicate such tokens were most effectual in averting an impending evil or securing an expected good. Thus a great impulse was given to this act of devotion, and the number of offerings was greatly multiplied. The poor supplied the place of stone models by little terra-cotta figures of small value, the offering of which was very much encouraged by the priesthood, as their consecra-

* Vide Cunningham's Bhilsa Topes, p. 169.

tion afforded the latter a small but constant source of income.* A similar cause in the present day promotes the offering of fictile models of horses to *Satyapir* and other local saints, and hundreds of them may be seen about every consecrated Banian tree in Bengal. The Buddhist figures were made after various designs and in different ways, but generally they were either cast in moulds or stamped on plastic clay. The basso-relievo tiles appear to be the most common. They contain figures of 1 to 20 or 30 chaityas impressed on them, and sometimes have also a figure of Buddha in the centre. In India they have preserved their independent character as objects of votive offering, but in Burmah they have been largely used in the ornamentation of temples and monasteries. That most if not all of them were, however, at one time votive offerings, is evident from the fact of many of them containing inscriptions recording the name of the donors. On the back of one of Colonel Phayre's tiles (No. 1) which was taken from the "upper layer of the arch of the relic chamber" of a temple at Pugán in Burmah, and which has the figures of 30 Buddhas and two chaityas impressed on it, there is a corrupt Mágadhi inscription in rude Burmese characters, which states that the tile was dedicated by one for the good of his parents and of all Buddhas past and to come. The words of the inscription as read by Burmese scholars have already been published, (ante p. 57) but as no attempt has yet been made to translate them and the reading appears to me to be incorrect, I here supply a different version together with a tentative translation. The reading I propose is :—

Aṭawisati mé buddha
Tiñsasammékona saha
Buddha íya tatta iya
Sabbán mátu pitu ara
Chariya putta ra a cha
Sabba satta hitá picha
Buddhá hitáti nágateti.

Translation—To the 28 Buddhas together with the 29th and the 30th, for the good here and hereafter of all, of my father and mother, of my tutor and his son, of all living beings, as also for the good of all Buddhas past and to come.

* Vide Col. Sykes' Note on the Miniature Chaityas, &c. in the Journal Rl. As. Soc. Vol. XVI. p. 37.

razer Lith

Calcutta.

COLOSSAL COPPER STATUE OF BUDDHA.

Notes on the Didunculus Strigirostris, or Tooth-Billed Pigeon of the Navigator Islands—the nearest living Ally to the extinct Dodo.

Communicated by Sir W. Denison.*

[*Received 4th Dec.*, 1863.]

Many of your readers, and especially those interested in natural history, will be glad to hear that the long lost tooth-billed pigeon, *Didunculus strigirostris*, is not quite extinct, as is generally supposed. This fact is now satisfactorily proved by a living specimen having been brought up to this city [Sydney] by Mr. J. C. Williams, H. B. M. Consul for the Navigator Islands, from Upolo, one of that group.

It will be needless to enlarge upon the great service thus rendered by Mr. Williams. Let it suffice to say that it is the only *living* specimen which has ever come under scientific notice, and in all probability will remain so. Scientific societies, both in England and Europe, have offered large rewards for this interesting bird, but it is to be hoped that if our Acclimatisation Society does purchase this bird, it will not share the fate of other rare specimens, and be sent out of the colony.

Mr. Williams has kindly allowed me to examine his specimen, which is still in Sydney; and has given me the following information respecting its habits, of which nothing has been previously made known.

The didunculus, or gnathodon, is known by the natives of the Navigator's under the name of the *manu-mea*. It was at one time very plentiful on those islands, and particularly upon Upolo, where Mr. Williams obtained his specimen; but owing to the number of cats which, having become wild, now infest the islands, this peculiar bird has become almost extinct. The natives also have had a share in its destruction, for as long as the birds could be procured in tolerable numbers, they were in the habit of making annual excursions into the mountains for the sole purpose of catching and feasting upon them. The game was secured either with bird-lime, made by mixing the sticky gum of the bread-fruit tree with oil, or by means of nets fastened to the end of long light poles and thrown over their victims, which were enticed within reach by tame decoy-birds kept for this purpose.

* These notes, apparently by Mr. Ramsay, Sir W. Denison's correspondent, comprise a printed extract from a Sydney newspaper, and a MS. description of the bird.

The manu-mea is strictly a ground pigeon, giving preference to the thickly wooded sides of the mountains, which, when these birds were plentiful, they traversed in flocks from ten to twenty in number, feeding upon various berries, and particularly upon the mountain plantain, for which they had a great liking.

When forced to take wing, they rose with a great flapping noise, which was so characteristic that even up to the present time, the saying, "as noisy as a manu-mea," is common among the natives.

The only note observed by Mr. Williams is a low plaintive cry something resembling that of a chicken, but not so shrill, nor repeated so often. The specimen which Mr. Williams has, is now about the size of our common domesticated pigeon, but as it is yet quite a young bird, it will probably grow much larger.

The natives still keep up the practice of pigeon feasting, and are using their best endeavours to exterminate the little brown ground dove, peculiar to the Navigator's Group, although at present this species still seems to be very plentiful.

In the photograph there is apparently a sort of crest on the head of the bird, this is caused by a gathering from the bird knocking himself about in its cage, it is only the feathers sticking out from the top of the head.

Didunculus Strigirostris.

Bill orange yellow at base, light horn colour nearing the tip, which is almost white with a dark line down the ridge, skin round the eye cere, fleshy orange very like the ordinary colour of Pigeon's feet, feet of colour more like the base of the bill. In the young bird the head and neck are dull slaty blue with a tinge of metalic green; breast dull dirty brown, abdomen same colour, tail and upper tail coverts, middle of back deep chestnut brown; wings brown, many feathers barred with red deep chestnut. The iris hazel brown; skin round the eye, fleshy orange. The second bird was very like the adult specimens figured in Gould's works, but not so bright.

[illegible]NCO[illegible]US [illegible]R GE[illegible]TRIS

Memorandum on the Elephant Statues in the Delhi Palace.—By Col. J. Abbott.

[*Received 2nd December*, 1863.]

In the last number of the Society's Journal, No. 111. of 1863, I have read with interest General Cunningham's remarks upon the life size statues found in the Royal citadel at Delhi.

As I happened to be at Delhi when these statues were disinterred, I had opportunity of examining them and at once recognised the long sought statues, mentioned by Bernier in these words.

"The entrance of the fortress presents nothing remarkable besides two large elephants of stone placed at either side of one of the principal gates. On one of the elephants is seated the statue of Jemel (meaning no doubt Jye Mul) the renowned Raja of Chitore. On the other is that of his brother Polta (Putta). These are the brave heroes who, with their still braver mother, immortalised their names by the extraordinary resistance which they opposed to the celebrated Acbar; defending the towns besieged by that great emperor with unshaken resolution and being at length reduced to extremity, devoted themselves to their country, and chose rather to perish with their mother in sallies against the enemy, than submit to an insolent invader. It is owing to this extraordinary devotion on their part, that their enemies have thought them deserving of the statues here erected to their memory. These two large elephants, mounted by the two heroes, have an air of grandeur, and inspire me with an awe and respect which I cannot describe."

Could I have supposed that any one visiting Delhi, would not have this account fresh in memory, I would earlier have troubled you with the reference.

Regarding Chittore, Ferishta says that when Akbar was besieging Chittore, after the failure of two assaults, the emperor was so fortunate as to shoot Jugmull, whom he had observed on the ramparts directing the defence. On which the enemy lost heart, destroyed their wives and children with fire, on a funeral pile with their slain chief, and retiring to their temples refused quarter, but were slain, (apparently without resistance,) to the number of ten thousand. This Jugmull must be the same as the Jemel of Bernier.

The Hindoo account as collected by Tod from the records and traditions of Mewar is as follows.

"But the names that shine brightest in this gloomy page of the annals of Mewar, which are still held sacred by the Bard and true Rajpootre and immortalised by Akbar's own pen, are Jeimul of Bednore and Putta of Kailwa, both of the sixteen superior vassals of Mewar. The names of Jeimul and Putta are as household words inseparable, &c. When Saloombra fell at the gate of the Sun, the command devolved upon Putta of Kailwa. He was only sixteen years of age. His father had fallen in the last shock, and his mother had survived but to rear this the sole heir of their house. Like the Spartan mother of old, she commanded him to put on the saffron robe and to die for Chittore. But, surpassing the Grecian dame, she illustrated her precept by example, armed the young bride of her son with a lance and with her descended from Chittore; whence the defenders saw the young bride fall fighting by the side of her Amazonian mother. When wives and daughters performed such deeds, the Rajpootees became reckless of life. They had maintained a protracted defence and had no thought of surrender, when a ball struck Jeimul who had succeeded to the command."

The northern ramparts had been entirely destroyed by the mines of Akbar. The fatal Johur or sacrifice of females was awaited, and at its close, the gates of the fortress were thrown open, the work of destruction commenced, and few survived to stain the yellow mantle by inglorious surrender. Akbar entered Chittore and slew 30,000 of his enemies. Nine queens, five princesses, their daughters, with two infant princes, and the families of all the chieftains not at their estates, perished in the fatal Johur or in the sack. The gates were taken for the emperor's fortress at Agra.

Akbar claimed the honour of Jeimul's death by his own hand. The conqueror of Chittore evinced the sense of the merits of his foes in erecting statues to the manes of Putta and Jeimul at the most conspicuous entrance of his palace at Delhi.

I have shortened and simplified Tod's inflated narrative which is often sufficiently obscure.

The origin of these statues is still matter of uncertainty. Had they been made by Akbar or carried from Chittore by him, we might expect to find them rather at Agra, his chief capital, than at Delhi.

The stone of which the elephants are built is of black colour and slaty texture, greatly resembling that of which the Indo-Greek sculptures are wrought near the Indus. There is nothing of this kind at or near Delhi; nor do I think it is found at Chittore: but of this I am not certain. Being in blocks of moderate size it may have been brought from afar. The statues stood at the gate of the citadel of Delhi at the commencement of Aurungzebe's reign. When that monster's religious frenzy attained its height, they were probably pulled to pieces, in deference to the hatred of the orthodox for images of all kinds. Bernier states, *not* (as quoted by Tod), that they stood at the *principal* entrance to the citadel, but that they stood at *one* of the principal entrances. This was probably the Delhi gate of the citadel; so called as facing the original city of Delhi. They were found buried in old and in recent rubbish, inside the citadel, at a spot intermediate between the two principal gates, but nearer to the Delhi Gate.

The screens to the citadel gates were built by Aurungzebe himself, and they could not perhaps have been built without removing these statues, which at any rate would be most suitably posted outside the gate of the screen. Supposing them to have been pulled down accordingly, it is not to be supposed that the saintly monster would have had any share in reconstructing idols.

P. S.—In Tod's narrative we are told that there were 30,000 inhabitants in the fortress of Chittore when it opened its gates. Yet he does not say that these rushed out sword in hand upon the enemy. And from Ferishta's account we gather that they could have made little or no defence, as few if any of the assailants were slain. The spirit of manhood seems to have deserted the breasts of the males to centre in that of the women. Indeed the brutal sacrifice of the Johur whilst 30,000 of the garrison survived, or even the ten thousand reckoned by Tod, denotes anything but the spirit of heroes. Undoubted instances of the gallantry of Rajpootres are on record. But they seem at times to have despaired very early in the day. Certainly no army of undisciplined troops could have taken Chittore if manfully defended by ten thousand men.

Observations on the Geolcgical features &c. of the Country in the neighbourhood of Bunnoo and the Sanatorium of Shaikh Boodeen.

—*By* C. P. Costello, Esq., *Asst. Surgeon, 6th Punjab Infantry.*

Communicated by the Punjab Auxiliary Committee of the Asiatic Society.
[*Received* 16*th February*, 1864.]

The Bunnoo Valley is surrounded by hills on every side—on the north by the hills of the Caubul Kheye Wuzeerees which are a continuation of the Sooliman range, on the south by the Batannee range: on the east by the Khattuck hills; and on the west by the Sooliman range. I am not possessed of any geological information regarding the Caubul Kheye hills. The Batannee hills strike off at an acute angle from the Sooliman range on the west, proceed at first in a south-easterly direction until they reach Peyzoo; and then run eastwards across the Murwut Valley; and terminate by sloping off towards the Indus at the junction of this river with the Koorum below Esan Kheyl. The portion of the range next to the Sooliman hills is called the Peyzoo hills, which terminate at Peyzoo. The next portion is called Shaikh Boodeen, which is about 6 miles in length, and terminates in sand [sandstone ?] hills (the highest of which is about 1200 feet above the plain below,) which form the termination of the whole range.

The Peyzoo hills are irregular, wavy, sand [sandstone ?] hills with two passes through them—the first, next the Sooliman range, being called the Baenderra; the second the Peyzoo pass. I have not obtained any fossils from these hills. Each pass is intersected by numerous nullahs.

Shaikh Boodeen is about 4,500 feet above the level of the sea; and the little hill station on its summit is the frontier Sanatorium. The general dip of the strata is towards the north, and their strike from east to west. The angle which the dip forms with the horizon is a good deal more than a right angle. The upper portion of the hills is composed chiefly of limestone, which very often is stained red and yellow by peroxide and bisulphuret [?] of Iron. Lower down the hill, there is more claystone mixed with blocks of limestone; and at the foot of the hill, we meet with the low sand [sandstone ?] hills continued from the Peyzoo range. This lowermost portion of the hill, is in many places covered with the *debris* of the higher parts, in the form of broken rocks

and lime mixed with sulphur [?]; this is most remarkable on the Agsun* Kheyl side. The limestone above-mentioned affords very good quick lime for building; and the stone itself is also very useful for the same purpose. The water found in springs at the foot of the hill has a strong chalybeate taste. Hitherto no springs of any consequence have been discovered on the hill higher up; but search is being made for them. The principal fossils (shells) found about the summit of the hill are Belemnites, Cardiums, Echini, and Pectens; also Turrilites, one or two specimens being in Capt. Urmston's collection which he has formed at Lahore.

This portion of the hill would therefore seem to belong to the "Upper Chalk."

On the very lowermost portion of the southern face, I have found a few specimens of a *Pecten* resembling the *Pecten Jacobæus*. The next portion of this range† is composed of sandstone hills, which are disposed in parallel ridges running from north to south. The highest ridge is about the centre of this portion of the range, the ridges on each side sloping off, on one side, towards Shaikh Boodeen, and on the other towards the Indus. From these hills, I have obtained portions of heads, teeth, tusks, vertebræ, and limbs of Mammalian animals. Amongst these, I may mention the head and teeth of the Mammoth and other species of Elephant. I have forwarded a number of these to the Lahore Exhibition; and as they are afterwards to be made over to Captain Stubbs, Offg. Sec., Punjaub Auxiliary Committee of the Asiatic Society of Bengal, I don't wish to make any special reference to any of them, until I know how far I have been correct in naming them. This terminal portion of the Batannee hills would, (on account of the occurrence in them of fossil species of the Elephant seem to belong to the Tertiary formation.

I don't know anything about the Khattuck hills. All I know of the Sooliman hills, is that the Wuzeeres find quantities of lignite and pyrites in them.

The Bunnoo Valley appears to be composed of modern alluvium. I have observed several vertical sections of the soil—some of them being from 20 to 40 feet in depth. In all cases, the sections have been formed of alternate layers of sand and conglomerate; most of the stones

* The northern side.
† Batannee.

in the conglomerate being rounded. In these layers species of Paludina, Planorbis, Limnea, &c. are found. The Koorum river enters the valley at its northern extremity through the Caubul Kheyl Wuzeeree hills; the Gombelah through the same hills, but more to the west. The latter unites with the former below Lukkie, and the Koorum thus enlarged, finally empties itself into the Indus below Esau Kheyl. It is not improbable, that the Bunnoo Valley was once a lake; and that the two rivers were the feeders of this lake; which probably, finally became emptied by the water gradually cutting its way through the pass in the Khattuck hills, through which the Koorum *now* runs to join the Indus. Between the southern face of the sandstone hills, (to the east of Shaikh Boodeen), and the Indus is another range called the Betote range; and the intervening valley is called the Lâgee Valley, at the mouth of which is the village of Punnialla.

This Betote range appears to be of the same composition as Shaikh Boodeen; at its upper portion at all events. From this upper portion, good limestone is also procured, and fossils of the same kind as on the upper portions of Shaikh Boodeen are I believe, found on it. From the middle and lower portions the following fossil shells have been procured —a good number by myself:—*Inoceramus sulcatus*, *Lima Cardiiformis*, *Producta horrida*, *Producta semireticulata*, *Spirifer striata*, *Calceola sandalina*, *Uncites gryphus;* and fossil Corals—*Syringopora ramulosa*, and *Lithodendron irregulare*.* These fossils with some others, are among those which will be made over to Captain Stubbs, R. H. A.

* The author is responsible for these and other identifications.—Eds.

Extract from Report of the Operations of the Great Trigonometrical Survey of India during the year 1862-63.—*By Major* J. T. Walker, R. E. *Superintendent G. T. Survey.*

[*Received* 10*th November*, 1863.]

In accordance with the sanction of Government, I proceeded, in the autumn of 1862, with the officers and assistants marginally detailed,* to Vizagapatam to measure a Base Line. Vizagapatam is situated nearly on the same parallel of latitude as Bombay; and is the point where the Bombay Longitudinal Series, when extended eastwards to the Madras Coast, will terminate. This series of triangles will form, with the Great Arc Meridional, the Calcutta Longitudinal, and the Coast Series, a vast quadrilateral figure, circumscribing the Meridional Series of triangles which are required as a basis for the interior topographical details. Base Lines had been measured several years ago, by Colonel Everest, at Beder, Seronj, and Calcutta, the S. W., N. W., and N. E. angles of this quadrilateral. One more Base Line remained to be measured, which, for considerations of symmetry, it was desirable to place in the vicinity of Vizagapatam.

Captain Basevi, the officer in charge of the Coast Series, being located at Vizagapatam, was directed to select the site. After several trials, owing to the difficulty of carrying a straight line, several miles in length, so as to avoid the numerous irrigation tanks with which this district is studded, he eventually succeeded in finding a suitable line, on the undulating plain between the Military stations of Vizagapatam and Vizianagram, at a distance of about fifteen miles to the west of the port of Bimlipatam. The ground was chosen before the commencement of the rainy season of 1862, when trenches were dug to carry away the expected rain fall during the monsoon, and every precaution was taken to keep the line dry. But when Captain Basevi took the field early in October, he found that the rains had been so heavy, that the surrounding tanks had been converted into lakes, and the line lay submerged under a sheet of water, in some parts as much as sixteen feet deep. By great exertions the water was drained off into adjoining ravines. A portion of the line was ready for measuring on my arrival in December, and the remainder had become fairly dried by the time it was reached, in the course of measurement.

* Messrs. Hennessy, Taylor, Campbell, Wood, Burt and Mitchell.

The apparatus employed, consisted of a set of Compensating Bars and Microscopes, on the principle of those designed by Colonel Colby, for the Ordnance Survey of Great Britain, which had been constructed under the superintendence of Colonel Everest, by whom they were brought out to India in 1832. This apparatus has been employed in measuring three Base Lines on the Great Arc, two at the north and south extremities of the Calcutta Meridional Series, and two at the extremities of the Indus Series. The length of these bases has, in each instance, been determined in terms of ten foot Standard Bar A, the unit of measure of the Indian Survey.

At the time this Standard was constructed, it was believed that the length of a well made iron bar, supported by rollers at its points of least flexure, might be considered invariable for any given temperature. But, of recent years, there has been a growing tendency to doubt the invariability which has hitherto been assumed. Series of comparisons made by the Ordnance Survey show there is much probability that the texture of an iron bar changes gradually in the course of years; for the factors of expansion obtained from groups of comparisons made at intervals a few years apart, differ from each other by larger quantities than are due to errors of observation. It is preferable, therefore, to employ several Standards, constructed of different metals, rather than to trust to the integrity of a single bar.

To ascertain whether our Standard has altered in length, it would be necessary to remeasure the whole, or part, of one of the Base Lines which were first measured after the arrival of the Bar from England. I wished to obtain some light on this subject, by remeasuring certain short sections of the Calcutta Base Line, the extremities of which were originally indicated by permanent marks. But, on examining the positions of the section markstones, I found that, though concealed from view, there had been a regular thoroughfare over them, for many years, of carts and elephants, as well as foot passengers; consequently, they must, in all probability, have been disturbed, and they cannot be safely referred to, to decide so delicate a matter as the constancy of the Standard.

Disappointed at being baffled in my efforts to investigate this matter by any simpler and shorter process than the remeasurement of a whole Base Line, I determined to mark the intermediate section stations of the Vizagapatam Base as permanently as the extremities,

in order that any future enquiry regarding the length of the Standard, at the time of the measurement of this Base Line, may be conducted without greater labour than the measurement of a short section.

It has been well said, by one of the greatest living authorities on scientific matters, that "the ends of a base line should be guarded with religious veneration." In this country they are liable to be viewed with mingled cupidity and dread; the natives sometimes fancy that money is buried below, or they superstitiously fear that the Englishman's mark will cast a spell over the surrounding district. In either case, the mark is liable to be destroyed, as has already happened at the Seronj Base Line.* To ensure the protection of the ends of the Vizagapatam Base, I have had substantial domes of cut stone masonry built over them, without any openings, so that, before the marks can be reached, the domes must be pulled down, which will be so laborious, that the Police should be able to hear of and arrest the perpetrators, before they have had time to harm the marks.

Captain Basevi, and the Assistants of the Coast Series Party, shared in the measurement of the Base Line, which occupied about two months. The length of the line is six and a half miles. It was divided into three verificatory sections, which were subsequently checked by two series of triangles, one on each flank of the base, to test the measure of each section against the others. These tests were satisfactory; for the extreme difference between the measured length of the whole base, and its computed length by triangulation from either section, has been found to be one inch. The comparison of the measured length, with the computed value brought down by triangulation from the Calcutta Base Line, is singularly satisfactory, for the error of the computed value is only a quarter of an inch, though the triangulation embraces a distance of four hundred and eighty miles,

* On this subject, the following extract is taken from a letter by Colonel Sir George Everest, C. B., to the President and Council of the Royal Society, dated 8th April, 1861:—

"The natives of India have a habit, peculiar to human beings in that state of society, of attributing supernatural and miraculous powers to our instruments, and the sites which have been occupied by them. In cases of death, or any other natural visitations, they often offer up prayers to those sites, and if the object of their prayers be not conceded, they proceed to all sorts of acts of destruction and indignity towards them; nay, as in all cases where it was practicable, my station marks were engraved on the solid rock *in situ*, they have been known to proceed in bodies, armed with heavy sledge hammers, and beat out every vestige of the engraving."

much of it passing over flat plains, which are covered with dense forest and jungle, and very difficult to work through.

On the completion of the Base Line, Captain Branfill was deputed to connect it with the principal triangles of the Coast Series, and to execute the verificatory triangulation between the sections. Meanwhile, Captain Basevi proceeded, by my instructions, to make a reconnoisance of the neighbouring territories of the Rajah of Jeypore.

It is a singular fact that, in the vicinity of the British stations of Vizagapatam and Vizianagram, and within sixty miles of a coast which has been frequented by British traders for upwards of a century, there is an extensive tract of country, subject to a friendly Rajah, of which less is known, than of districts occupied by hostile tribes, along the frontier of our recently acquired Punjab Provinces. A glance at any map of the Madras Presidency reveals a great blank in our geographical knowledge, in the tract of country which lies parallel to the coast, and North-East of the Godavery river. Its deadly reputation appears to have been a bar alike to the explorations of the curious and scientific, and to the visits of sportsmen. No regular survey of it has ever been attempted; the few places given in the map seem to have been obtained from native information, for they are generally exceedingly erroneous.

A reconnoisance of this tract was required for our own operations, in the extension of the Bombay Longitudinal Series to Vizagapatam. As any reliable information regarding lands so little known might be expected to be of much value and general interest, I was much gratified when Captain Basevi volunteered to reconnoitre this *terra incognita;* though, at the same time, I could not but feel apprehensive for his safety in a country so deadly, for his route would have to pass through dense jungle, in which it would be necessary for him to preserve his reckoning by the troublesome process of traversing; which, under such circumstances, is very laborious, and entails the necessity of performing the greater part of each day's march on foot. The inevitable exposure to be thus undergone is very great, in a tropical climate, and when the district to be traversed is known to be exceedingly feverish and unhealthy, no small amount of courage is needed, to prompt a man to volunteer for such a task.

Captain Basevi took with him one European Assistant, Mr. O'Neill, and a few natives. He, himself, fortunately escaped with a

slight attack of fever, but Mr. O'Neill suffered severely, and has not yet recovered, and the natives of the party were also, more or less, incapacitated by fever, so that but for the assistance afforded by the Rajah of Jeypore, the operations would have been stopped almost at their very commencement. The results are, a good preliminary map of Jeypore, which has been forwarded to the Surveyor General, to be lithographed and published; a report by Captain Basevi, giving details of his route, and a general description of the country; several valuable astronomical determinations of latitudes and longitudes, and barometrical determinations of heights; also memoranda of various other routes, the details of which were obtained from native information. In consideration of the great value of Captain Basevi's services, he has been permitted to proceed to Europe on furlough for one year, during which his appointment will be kept open for him.

During the summer of 1862, the Field Season of the Kashmir Survey Party, the triangulation made great progress to the east of Leh, and stations were fixed on the Chinese Frontier, from which a number of peaks in Tartary were determined. Some of these were more than one hundred miles distant, and will materially aid in the construction, from native information, of maps of districts into which the surveyors will probably be unable to penetrate. Several of the stations observed from were over 20,000 feet in height above the sea, and Mr. Johnson visited one peak of a height of no less than 21,072 feet, but, owing to a very heavy fall of snow, was unable to observe from it.

A great many points were fixed in the Pangkong district. The whole of Astor was triangulated, aad several peaks were fixed to the north of Gilgit; none of these were of any great height, the highest being only a little over 19,000 feet. The natural difficulties of the country were at first much enhanced by bad weather, which came on with the heavy rains in the southern and outer Himalayan Ranges. Notwithstanding these circumstances the out-turn of work has been good, and the general progress very satisfactory, the total area of the triangulation being about 10,500 square miles, and of topography 10,400 square miles, on the scale of four miles to the inch.

The topographical operations made good progress, though not so great as would have been the case had all the assistants retained

their health. Unfortunately two of them, on entering the higher ranges, broke down completely, and a third had to leave off work early in the season. The ground sketched was generally very elevated and barren, the Surveyor's chief difficulties arising from the want of provisions and firewood, and sometimes even of fresh water. The plane table sketches required for the map of Little Tibet have been completed, and lodged in the Head-Quarters Office at Dehra. A glacier, about twenty miles in length, was discovered by Mr. Ryall at the head of the Nubra Valley. Some large glaciers were also found in the neighbourhood of the Nanga Parbat.

I fully concur in the testimony which is borne by Captain Montgomerie, to the great zeal with which these arduous Survey operations have been carried on by all the assistants under his orders. The good fortune of success has hitherto attended all undertakings executed under the superintendence of this officer.

There is much reason to expect that, if the snows are not unusually heavy, and if most of the Surveyors keep in good health, the remainder of the country to be surveyed in and around Kashmir and Ladak, will be completed during the next field season. Captain Montgomerie has made every effort to persuade the Maharajah of Kashmir to allow one of our Surveyors to go to Gilgit, and has obtained a half promise to this effect. Possibly the fear of being called to account, should any harm happen to a European in his territories, causes the Maharajah to hesitate to sanction an undertaking which might be somewhat perilous. He informed Captain Montgomerie that, during the late winter, his troops in Gilgit had been sleeping; no exacter information could be elicited than what is suggested by this metaphor. If, as Captain Montgomerie thinks likely, the sleep was that which knows no waking, the Sikh garrison of the Maharajah must have been massacred by the hill tribes, in which case there is little hope of our Surveyors being soon able to penetrate into Gilgit.

The Eastern Frontier Party, under the charge of Mr. C. Lane, Chief Civil Assistant, has been employed, throughout the Field Season, in Independent Tipperah. At the end of the preceding season this triangulation had reached a point to the South of Cherra Poonjee, on the confines of Tipperah, where the British Boundary retrogrades Westward to a considerable distance, so that the triangulation would

have had to make an extensive circuit, in its onward progress to Chittagong, had the operations been required to be kept within the British Boundary. Fortunately, Mr. Buckland, the Commissioner of Chittagong, had sufficient influence with the Maharajah of Tipperah to induce him to consent to our operations being carried across his territory, on the direct line to Chittagong.

Mr. Lane proceeded, in the first instance, to Agartolla, the chief town of Tipperah, where the Maharajah resides; and there he succeeded in securing the friendship and good-will of the Prince and his Court to an extent to justify the expectation, which was subsequently realized, of obtaining their cordial assistance and co-operation. Mr. Lane deserves much credit for the tact he has displayed in cultivating amicable relations with the barbarous races that inhabit the hill country of Tipperah, who have long been a terror to the industrious population of the plains within the British Frontier. Mr. Lane has sent a valuable report on the portion of Independent Tipperah traversed by himself and Assistants during the past Field Season, from which extracts will be given in an appendix to this Report.*

* The duty of selecting stations for the Triangulation devolved on Mr. Rossenrode, than whom the party could not have had a better pioneer. The following simple narrative of his operations is extracted from his letters:—"When the Kookies were apprized of my arrival at Heara, they naturally concluded that I had come to apprehend and punish them for the robberies and murders they had perpetrated on our frontier. They hid themselves in the jungles, and left their villages. With much persuasion the Rajah's people brought them to my camp. They watched all my proceedings, and asked me no end of questions. I always keep a man near me to interpret, and I answer every question they put me; all seem satisfied with my answers, and the confidence I place in them. Of course my movements are slow, because my work has the greatest difficulties to contend with; the inhabitants must be conciliated, the site to be fixed upon must be traced and found, and cleared of jungle. To fix on sites at all in this dense and almost uninhabited forest, in which the sun can seldom be seen, is a feat any man may be proud of, especially when the inhabitants try to mislead. I hope to get on faster, when I divest the minds of these savages of all suspicion. I am all day long climbing or descending hills, or wading through water. Wild elephants and buffaloes are numerous, and may be come upon suddenly, when wading through the watercourses. Whenever you see a bamboo signal, avoid the direction it points to, because an unerring arrow is placed there, with a bow strong enough to give an elephant his death blow. The Kookies think of nothing but eating and drinking. Feeding them occasionally is a good plan, and they would become very much attached to you, and follow you like dogs, and, no doubt, prove faithful, and work well, if well fed. Last year I had to deal with the Nagas and Kookies of Cachar, as well as those on the Manipoor frontier. They are the same filthy, naked savages as their brethren in Independent Tipperah. They frequently enquired whether I knew of Captain Guthrie, who made the road from Cachar to Manipur, over the hills, and they said he was the best sahib they had ever met with, and gave them buffaloes, cows, pigs, and goats to eat daily, and grog to drink, so that, even now, they think of his feasts.

The East Calcutta Longitudinal Series Party was formed on the 1st September, 1862, and placed under the charge of Lieutenant Thuillier. The object of this Series is to become the basis for the surveys of the districts of Nuddeah, Jessore, and on, *viâ* Dacca, to the Eastern Frontier, along a parallel of latitude slightly North of Calcutta. The publication of the sheets of the Indian Atlas, which embrace these districts, has long been delayed for want of this triangulation.

The party proceeded from Dehra Doon, by steamer and railway, to Calcutta, where they took the field in November, on the termination of the rainy season. Operations were commenced at Chinsurah, on a side of the Calcutta Meridional Series. Much assistance was derived from a carefully executed Map, prepared in the Surveyor General's office, by which Lieutenant Thuillier was enabled to lay out his lines so as to pass through a minimum amount of property. In working through forests and jungle, it is usual, in the first instance, to cut a narrow glade, in a perfectly straight line, through all intermediate obstacles, in the direction of the required station; when this

"I must notice one peculiarity among the Kookies. They all assemble from adjoining villages of the same tribe, and perform the work allotted to them, and share the hire. If you want twenty men from a village, and there are sixty in that village, all will come, whether you wish it or not. If they have to cut jungle, they will all do it; if they are to carry loads, they will divide the twenty loads into sixty, and each man will carry something. One man will never act as a guide, or do any work singly; he must have a companion, and both must be paid. I have tried to break through this habit, but have been told that, if all are not allowed to work, they will not come at all. One might suppose that sixty men would finish the work sooner than twenty, but this is not the case; they eat three times a day, will not begin work before nine, they work until twelve, and then walk off, without asking or telling anybody. They remain away two hours, cooking and eating, and then return and work till an hour before sunset During the working hours, some are smoking, some making drinking mugs from the bamboo, and others amusing themselves; half are thus occupied, while the remainder are working, and then they change about, and those who are relieved smoke, making drinking mugs, walking sticks, or otherwise amuse themselves. The Rajah's agents have no control over them, and they do not always obey their own Sirdars.

"A Kossyah coolie is really worth four Kookies. When a Kossyah carries a light load, or is lazy, he is called a Kookie by his companions, which annoys him so that he will carry the heaviest load, or tuck up his sleeves, and work in right good earnest. I attribute the Kookie's want of energy and inability to carry loads to the excessive use of spirits, which are distilled in every hut, and partaken freely by every member of the family. There are many Chiefs among the Kookies in the Tipperah Raj. These are all called Rajahs; they have their Wuzeers, Nazirs, and Sirdars, and a number of servants of both sexes. The Kookies have no written language. The Rajahs never pay visits, even to the Maharajah, and their Wuzeers and Nazirs are sent to the Court only on very important occasions."

trial line has been carried over a distance of eight to ten miles, the ground beyond is carefully reconnoitered for a suitable site, to which a line is cut from a convenient point in the trial line; thus two sides and the included angle of a triangle are given, with which data it is easy to ascertain the direct line between the two stations, which is then cleared to obtain mutual visibility. Owing, however, to the valuable nature of the property through which the triangles were carried, it was necessary to run a traverse along each line, with numerous intermediate bends, to avoid houses and orchards. In clearing the final line, great caution was requisite to prevent any tree from being cut down needlessly, a matter of some importance in Bengal, where every tree is more or less valuable, and has to be paid for. These circumstances greatly increased the labour of the preliminary operations, and protracted them over a longer period than is usual.

Further delay was caused in building the principal stations. These are usually, towers, with a central pillar, four feet in diameter, of burnt brick and lime masonry, surrounded by a platform of unburnt bricks and mud, fourteen to sixteen feet square, the whole raised to a height of twenty to forty feet, according to the nature of the obstacles to be overlooked. This structure has been adopted on account of its cheapness, and the rapidity with which it can be constructed; it has hitherto been found to be well adapted for our requirements. But it appears to be inapplicable for the rainy and moist climate of Eastern Bengal, where unburnt bricks rarely have an opportunity of drying sufficiently to be safely used, in raising a structure of such necessarily large dimensions. At one of Lieutenant Thuillier's stations, in consequence of the employment of damp materials in the unburnt brick work, and constant and heavy falls of rain during the construction, the building gave way, under the weight of the instruments and observatory tent. Fortunately, the large Theodolite was packed in its case, and received no injury, but the season was too far advanced for the tower to be rebuilt before the setting in of the monsoon, and as the mishap occurred in the first polygon of the principal triangulation, and there were no more towers ready in advance, the out-turn of work, as measured by the area triangulated, is unusually small, though much valuable experience has been gained, and there is every reason to hope that there will be a full out-turn of work next season. The design of the tower stations will have to be altered to suit the climate

of Eastern Bengal; in lieu of the present solid mass of earthwork, it will be necessary to build a masonry wall around the central pillar, to support the observer's platform.

The Rahoon Meridional Series, under the superintendence of Mr. H. Keelan, First Assistant G. T. Survey, was brought to a termination during the last Field Season, by being extended southwards until it joined the Great Longitudinal Series of Triangles, connecting Calcutta and Karachi. The meridional distance triangulated is sixty-nine miles, by thirteen principal triangles, arranged in polygons, for mutual verification, and covering an area of 1,603 square miles.

This Series has taken six years to accomplish. It was commenced by Mr. Logan, late First Assistant G. T. Survey, but has been chiefly executed by Mr. Keelan. It is double throughout, the triangles being arranged in successive quadrilaterals and polygons of remarkable symmetry. Its meridional length is 457 miles; the principal and secondary triangles cover an area of 23,620 square miles. The computations and maps connected therewith will be completed by the 1st October, when the party will be transferred to the districts on the meridian of 84°, between Sumbulpoor and the East Coast. The total cost of the operations, up to 1st October, will be about Rupees 2,01,609, which gives a rate of Rupees 8-8-6, or about 17 shillings per square mile.

The field operations of the Gurhagurh Series, on the meridian of Umritsur, were brought to a termination at the end of season 1861-62, when it formed a junction with the series of triangles on the same meridian which had been brought up by Captain Rivers as far as Ajmere, from the Great Longitudinal Series. By the 1st October, 1862, the recess computations and charts were completed, and the party was available for transfer elsewhere. This Series has taken five years to complete; the greater portion has been executed by Mr. George Shelverton. Its meridional length is 557 miles; the area covered by the principal and secondary triangles, 19,096 square miles; the cost, Rupees 1,08,212, which gives a rate of Rupees 5-10-8, or about 11 shillings per square mile.

The Sutlej Series follows the left bank of the Sutlej from its junction with the Indus, near Mithunkote, to a side of the Gurhagurh Series near Ferozepoor. It was commenced towards the close of Field Season 1860-61 by Lieutenant Herschel, and was completed

last season by Mr. Shelverton. It is single throughout. The recess computations will be completed by 1st October, when the party will be transferred to the meridian of 80°, to execute the required triangulation between Jubbulpore and Madras. During the past Field Season the triangulation extended over a distance of 112 miles, covering an area of 1,366 square miles. A very creditable amount of secondary triangulation was also executed. The total cost of the Series, up to 1st October, the date of its completion, will be about Rupees 80,743; the total area covered by the triangulation is 8,142 square miles, thus giving a rate of Rupees 9-14-8, or nearly 20 shillings per mile.

The Bombay Party, under the superintendence of Captain Haig, Royal (Bombay) Engineers, having completed the triangulation in Northern Bombay, was deputed to execute a series of triangles to the south of the parallel of Bombay, on the meridian of Mangalore. While the preliminary operations and selection of stations were proceeding, Captain Haig marched to the origin of the Bombay Longitudinal Series, with a view to making this Series double throughout, by adding flank stations, so as to form polygons in parts where there were only single triangles. On reaching the ground, it was found that the ends of the Beder Base Line were, fortunately, in good preservation. Three of the advanced stations had, however, been completely destroyed. Captain Haig judiciously determined to triangulate the Series anew, as far west as the Mangalore meridian. The revision having been executed with a much superior instrument to that employed in the original triangulation, the value of this portion of the Bombay Longitudinal Series is very greatly enhanced.

Having completed this revision, Captain Haig was proceeding with the principal triangulation on the meridian of Mangalore, when an untoward accident brought his operations to an abrupt termination. The large Theodolite was set up for observation on the tower station of Palwau, when, without any previous warning, the tower gave way on one side, causing the fall of the instrument and observatory tent, whereby the instrument was so seriously injured that it is incapable of being again used, until it has been repaired by the makers in England. Fortunately, the horizontal circle, the most valuable portion, appears to have escaped injury, but the vertical circle was destroyed, and the injuries are such that the instrument cannot be repaired in this country. Captain Haig convened a Court of Enquiry to report

on the circumstances; the proceedings of the Court have already been submitted to Government. The Court came to the opinion, in which I entirely concur, that the fall of the tower was occasioned by the sudden and unexpected sinking of the ground below, and that no blame is attributable to Captain Haig, or any other person, for the mishap.

Captain Haig had already turned out a very excellent season's work, comprising thirty-two principal triangles, covering an area of 6,625 square miles, and extending over a length of 260 miles, whereof 66 appertain to the Mangalore meridian, and 194 to the parallel of Bombay.

The Spirit-Levelling Operations were carried on by Mr. Donnelly, Civil Second Assistant, under the superintendence of Lieutenant Thuillier. The party accompanied me to Calcutta, to receive the necessary instructions regarding the programme of the season's operations, which could not be decided on until I had obtained reliable information regarding the Railway levels between Calcutta and Agra. I had hoped to be able to incorporate these into our work, so as to avoid the labour and expense of carrying a line of levels all that distance. During the previous Field Season, a connection had been made, at Agra, with the Railway levels brought up from Calcutta, and the Trigonometrical Survey levels, brought up from the mean sea level at Karachi. The two sets of results differed by about twenty-four feet, and it was hoped that all difference would disappear, on connecting the Railway datum, the site of Howrah Dock, with the mean sea level of the Bay of Bengal.

That level had already been closely ascertained, by a Series of Tidal Observations taken at Kydd's Dock, and subsequently verified by others taken at Kejiri, from the description of which (*vide* footnotes, next page,) it is evident that the mean sea level of the Bay of Bengal may be considered to be known to within a few inches of the truth. On connecting the Railway levels with Kydd's Dock, it was found that there still remained a difference of about twelve feet between the Railway and the Survey height of Agra. On discussing this subject with the Chief Engineer of the Railway, I ascertained that there were several breaks in the Railway levels, that, in consequence of the pressure of other work, there had been no opportunity of preparing a correct and true section of the whole line, and that it was contemplat-

ed to re-level the line, as soon as the Engineers had leisure to do so. I decided, therefore, on deputing the Levelling Party to re-level the line of the Railway, and connect all the Trigonometrical Stations within reach thereof.

Mr. Donnelly made good progress, and accomplished two hundred and forty-two miles of first-class levelling,* forty-one of which had to

* With an Assistant levelling the line, independently, behind him, station by station, after the method described in the published volume of Tables of Heights.

The following description of the connection of Kydd's Dock with the mean sea level of the Bay of Bengal is taken from a Report, dated 1st November, 1854, on the Calcutta Meridional Series, by Colonel Waugh, Surveyor-General, and Superintendent G. T. S. :—

"A Register of the Tides in the River Hoogly is regularly kept at Kydd's Dockyard, near Calcutta, the height of each successive tide being referred to a fixed datum line or zero, which is the bottom or sill stone of the dock, and therefore, an object of invariable character.

"A transcript of the Register of the Tides for two years viz.,—from May, 1846, to April, 1848, having been obtained from the Marine Department, a Monthly Abstract of Mean Tides was deduced therefrom.

"The waters of the ocean would maintain a constant level if undisturbed by the action of the Sun and Moon. La Place has demonstrated that this level is a mean between the highest and lowest state to which the surface of the ocean is reduced by the attraction of those bodies. This mathematical truth is corroborated by observations made on open coasts, from which it results that the mean of high and low water for two consecutive tides represents, very nearly, the level of the sea, and that the average for a lunation is constant within a very small quantity.—*Vide* Professor Whewell's Report, 7 vol., British Association's Report

"An examination of the Abstract of Monthly Mean Tides will, however, show that considerable irregularity exists in the River Hoogly, the monthly means differing as much as six and a-half feet. Now, if the annual average be considered as the true level of the sea, it would follow that for some months, consecutively, the mean height of the River is two and a-half feet below the sea level, a conclusion which is altogether inadmissible.

"The lowest monthly mean tide occurs about February and March, when the fresh water in the river is lowest, and strong Southerly winds do not prevail. The mean tide rises gradually, as the river rises during the South Monsoon until it attains its maximum in September or October, at which time the monthly mean exceeds that of February by no less than six feet. This rise is, obviously, the effect of accumulation, produced by inundation in the valley of the Ganges, and the force of the South-West wind, which dams up the freshes in the long and narrow channel of the river.

"It has been remarked by Colonel Cheape, Chief Engineer, in his Memoirs, dated April, 1825, that the surface of the Salt Water Lake, wherein the rise of the tide is almost imperceptible, would, on account of its wide expanse, represent very accurately the level of the sea with which it communicates. He also observes that Captain Taylor's levels indicate that the surface of the lake in the dry season, is 2*f.* 4·3*ins.* below the mean state of the river. This result corresponds very nearly with the mean tide of the river itself, which in February is 2*f.* 5*ins.* below the level of the annual mean.

"Colonel Cheape further states that the periodic rise of the surface of the lake in the wet season is ten inches. Now, the contemporaneous rise in the mean tide of the river has been shown to be six feet, and as the cause of these elevations is precisely the same, though the effects are in the ratio of seven to

be re-levelled, on account of large discrepancies which were found in the Railway levels. The operations had reached the vicinity of Bha-

one, the greater rise in the river can clearly be attributed only to the narrowness of its channel compared with the bay; it is probable that a considerable portion of the rise of ten inches in the surface of the lake is also due to accumulation; so that, although a rise may be supposed to take place in the level of the sea at the head of the bay, during the continued pressure of the S. W. Monsoon, still, that elevation must be much less than what takes place in the lake, where the effect of this rise is increased by the narrowness of the channel, and the influx of fresh water during the inundation.

"It has been shown that if the annual average of mean water be taken as the sea level, it would lead to the inadmissible conclusion that, in the dry season, the average level of the river at Calcutta is twenty-nine inches below the sea, with which it freely communicates. It has also been shewn that the surface of the Great Salt Water Lake, in the dry season, is on a level, or nearly so, with the mean tide of the river at the same time. It is likewise manifest that the periodic rise of mean tide during the monsoon, to the extent of six feet in the river and ten inches in the lake is occasioned by local causes, independent altogether of the true level of the sea, which is a constant level, and these causes, it appears, operating in narrow channels, are capable of producing exaggerated results in the proportion of seven to one, showing clearly the fact of accumulation. Hence the conclusion is inevitable, that the lowest monthly mean tide of the river, observed in February and March, represents the nearest approximation to the actual sea level, and that the rise of mean tide at Calcutta during other months, may fairly be ascribed to disturbing causes of an inland character, altogether independent of the true and constant level of the ocean. The variable character of the disturbing causes is shewn by the fact that the monthly means of corresponding months for the two years differ considerably, except in the months of February and March, the monthly mean tides of which are very accordant.

"Proceeding upon this principle, I have used the following observations to refer the datum line in Kydd's Dock to the sea level:—

"Mean Tide February, 1847, above datum, as measured on Guage,					...	8·11 feet.
„	March,	„	„	„	...	8·45 „
„	February, 1848,	„	„	„	...	8·48 „
„	March,	„	„	„	...	8·50 „
„	February, 1850,	„	„	„	...	8·28 „
„	March,	„	„	„	...	8·62 „
„	February, 1851,	„	„	„	...	7·94 „
„	March,	„	„	„	...	8·36 „
				Mean,	...	8·343 feet.

"Correction for Error of Graduation on Guage by Mr. Bedford's Measurements, ... 0·233 feet.

"By Tides measured at Calcutta in February and March, Mean Sea Level above datum, ... 8·576 feet.

"Again, in the years 1850 and 1851, Mr. Bedford, the Marine Surveyor, took a series of tidal observations at Kejiri, and connecting this point by a series of levels with Kydd's Dock, found that the datum line at the latter point is 9·07 feet below the sea level. Mr. Bedford's observations from which this result is derived, are as follows:—

	feet.	inches.
"Mean Height of Sea Level above the datum line at Kejiri, ...	8	9·75
"Datum Line at Kejiri above that of Kydd's Guage, ...	0	2·88
"Sea Level above the datum line of Kydd's Guage, ...	9	0·63

"Which reduced to decimals of a foot becomes, ... 9·053

gulpore, when Mr. Donnelly was compelled, by severe illness, to close work.

Mean Levels of the River's mouth at Kejiri, at Neap Tides, for the years 1850 *and* 1851, *excluding the South-West Monsoon.*

Months.	Highest Low Water.		Lowest High Water.		Mean.	
1850.	*Feet.*	*Ins.*	*Feet.*	*Ins.*	*Feet.*	*Ins.*
January,	5	0	11	9	8	$4\frac{1}{2}$
	4	0	11	9	7	$10\frac{1}{2}$
February,	5	6	11	0	8	3
	4	9	11	6	8	$1\frac{1}{2}$
March,	6	0	11	0	8	0
	4	9	12	0	8	$4\frac{1}{2}$
April,	6	9	11	0	8	$10\frac{1}{2}$
	4	9	12	6	8	$7\frac{1}{2}$
May,	6	9	12	0	9	$4\frac{1}{2}$
	5	3	13	0	9	$1\frac{1}{2}$
June,	6	6	13	3	9	$10\frac{1}{2}$
	6	0	14	9	10	$4\frac{1}{2}$
November,	7	0	12	3	9	$7\frac{1}{2}$
	4	9	13	0	8	$10\frac{1}{2}$
December,	5	9	11	9	8	9
	4	6	12	3	9	$4\frac{1}{2}$
1851.						
January,	4	6	11	9	8	$1\frac{1}{2}$
	4	3	11	0	7	$7\frac{1}{2}$
February,	4	3	11	3	7	9
	5	0	10	3	7	$7\frac{1}{2}$
March,	4	9	11	0	7	$10\frac{1}{2}$
	6	3	11	9	9	0
April,	5	3	12	9	9	0
	7	0	10	6	8	9
May,	5	6	12	9	9	$1\frac{1}{2}$
	7	0	12	6	9	9
June,	6	0	14	6	10	3
	6	9	13	3	10	0

During the year under review, I was called upon to collect all the available data of levels, existing in the Public Works, Railway, and

"Which differs from my determination by half a foot; but, if the tides at Kejiri for February and March be alone taken into account, at which period the inland waters flowing seaward are lowest, the result would agree with that derived from my discussion of the tides at Calcutta to about one inch."

Survey Offices, all over India, in order to reduce them to a common datum. As a first step towards this desirable measure, I have published a volume of Tables of Levels, based on the Spirit-Levelling Operations of this Survey, and reduced to the mean sea level of Karachi Harbour, as their datum. Additional volumes will be published as soon as possible. They will enable officers of the Public Works and Railway Departments to reduce their levels to the mean sea, by connecting them with the nearest Bench Mark, or Station, of the Trigonometrical Survey. In most instances, however, the business of connecting will probably devolve on the Survey Department. At present, we have only one Levelling Party, which is employed in Bengal; I therefore submitted a project for the formation of other parties to carry on operations, simultaneously, in the Madras and Bombay Presidencies, as the only means of speedily accomplishing an operation, of which the practical value will be greatly enhanced by early completion. Unfortunately, financial reasons have interfered to prevent this proposal from being sanctioned.

I now proceed to report on the Astronomical Observations for the determination of the Latitude and Longitude of the Andaman Islands, which were instituted on a representation by the Superintendent of Port Blair, that the erroneous positions assigned to some of these Islands, in the published Charts, endangered the safety of ships sailing between Calcutta and Singapore. Under the orders of Government, in the Home Department, the Surveyor General had deputed a Surveyor, Mr. Nicolson, to conduct the necessary observations, the superintendence of which was subsequently transferred to the Trigonometrical branch of the Survey.

Mr. Nicolson started from Calcutta early in December, 1861, to reconnoitre the Coco and Andaman Islands. He found that, in order to take a complete Series of Astronomical Observations at the Great Coco, it would be necessary to have a steamer placed at his disposal for some weeks, to keep up his communication with Port Blair, and bring the necessary supplies for his party.

About this time, a communication was received from the Bombay Government, representing that there was as much doubt about the accuracy of the position of Port Blair, as of that of the Coco Islands. Under these circumstances, it seemed advisable that Mr. Nicolson should begin operations by fixing Port Blair, in order that the proposed

operations might be commenced at the place where the greatest facilities for their execution existed.

The inaccuracy of the present Charts of the islands lying between Sumatra and Burma being admitted on all sides, it appeared necessary, in the absence of any regular survey of those islands, to fix, by astronomical observations, the positions of Acheen Head, Port Blair, the Great Coco, or the Preparis Island, and an island in each of the other groups, intermediate between Acheen Head and Cape Negrais. It is believed that the relative positions of the mutually visible islands of each group are already correctly shown on the Charts; consequently, by determining the absolute position of a point in each group, it would be possible to rectify the existing Charts, without making a general re-survey.

Mr. Nicolson, having completed his reconnoissance, returned to Calcutta in February, 1862, by which time one of the large 3-foot astronomical circles of the Trigonometrical Survey had been got ready, and a portable observatory, with rotating dome, constructed for the observations. There was no good astronomical telescope available in the stores of the Mathematical Instrument Department; consequently, Mr. Nicolson was directed to take all his observations, whether of occultations, eclipses, or moon culminations, with the telescope of the astronomical circle, which he could point to any part of the sky, through the aperture in the rotating dome of the observatory. Owing, however, to the small number of occultations and culminations which occur monthly, and the risk of losing some of them in cloudy weather, Mr. Nicolson was directed to base his observations for Longitude chiefly on the measurement of lunar zenith distances, for which the astronomical circle is well adapted. He was supplied with an astronomical clock, and all other necessary instruments, from the Calcutta Observatory.

In May, 1862, Mr. Nicolson had set up his observatory at Port Blair, and was ready to commence observations. Unfortunately, the season of fine weather had then nearly terminated; the Monsoon set in with unusual severity, nights favourable for observing were few and far between, and, consequently, several months elapsed before the whole of the necessary observations for Latitude and Longitude were completed. The work was further impeded by the delays attendant on postal communication between Calcutta and Port Blair, making it very

difficult for me to exercise that degree of supervision over the operations, which their delicate and difficult nature required.

By the end of 1862, Mr. Nicolson reported that he had taken a sufficient number of observations to fix the position of Port Blair; he, therefore, applied for a vessel to be placed at his disposal to enable him to proceed to fix the positions of the Great Coco, and other islands. Owing to postal and other delays, it was not until the end of February, 1863, on my return from Vizagapatam, that I learnt from the Marine Department that no vessel was available, nor could one be got ready before the fine weather season would have terminated.

From the same communication I also learnt that the Secretary of State for India had ordered a complete Maritime Survey of the Andaman Islands to be executed. Being then in Calcutta, I went to Captain Rennie, the Secretary to Government of India, Marine Department, and was informed that, under instructions from the Admiralty Hydrographer, it had been determined to find the differences of Longitude between the various groups of islands, chronometrically, by a battery of thirteen or fourteen chronometers.

The circumstances under which it was originally proposed to fix a series of positions by astronomical observations had thus entirely altered. The complete Maritime Survey, which has been ordered by the Right Hon. the Secretary of State for India, renders further astronomical observations unnecessary. The determinations of differences of Longitude, which are the only really difficult portion of the work, can be done chronometrically by the Marine Surveyors, with much greater rapidity and economy, and, probably, even with greater accuracy, than by the best astronomical observations for absolute Longitude.

Consequently, in March last I desired Mr. Nicolson to restrict his operations to taking as many more observations for the determination of the Longitude of Port Blair as could be obtained before the setting in of the monsoon, and then to return to Calcutta. He reached the Presidency in June, and has ever since been employed in reducing his observations. They consist of 32 lunar culminations, 136 lunar zenith distances, 130 transits of clock stars, and 162 meridional zenith distances of stars for Latitude, observed up to the 12th March, when the astronomical clock met with an accident, and Mr. Nicolson was afterwards obliged to employ a chronometer. His subsequent observ-

ations are, consequently, not as valuable as the earlier ones; they consist of 9 culminations, 64 lunar zenith distances, and 36 clock stars. The whole of the Latitude observations have been reduced, and found exceedingly satisfactory. There has not yet been leisure to reduce more than a few of the observations for Longitude, but the results obtained hitherto are satisfactory. The final resulting Longitude will be communicated for publication in the *Calcutta Gazette* as soon as ascertained. It should serve as an excellent datum for the proposed Maritime Surveys, and save the expense of a series of voyages between Madras and Port Blair, which would otherwise have to be incurred to obtain a good chronometric determination of the Longitude of Port Blair.

[A tabular abstract statement of the field-work executed by each party during the official year 1862-3 is given on the next page.]

The Computing Officer has been employed in a variety of preliminary operations, which are necessary to form the basis of a general reduction of the whole of the principal triangulation of this Survey, which will shortly become necessary, now that almost the whole of the triangulation of the tracts of country comprised in the great quadrilateral figure connecting Calcutta, Karachi, Attok, and Purnea, is completed. Though the triangulation has been executed with the very best instruments, and though the system of observation which was introduced into this Department by Colonel Everest, is more rigorous and accurate than that of any European Survey, it is evident that, in consequence of the vast length of each Series, and the imperfections which necessarily attend whatever is the work of human hands, each Series generates a certain amount of error, which becomes apparent as linear error, on the termination of the Series on a measured base line, while on the close of a circuit formed by two Meridional Series, and the portions of the connecting Longitudinal Series at their extremities, it produces errors of Latitude, Longitude, and Azimuth. The dispersion of these errors in such a manner as to obtain the most probable results of the whole, giving its due weight to each fact of observation, and taking into consideration the bearing of every such fact on all the rest, is a matter of great intricacy and difficulty, on which it will be necessary for me to consult with the ablest mathematicians of the present day in Europe, before deciding on the system to be finally adopted. Meanwhile, the necessary preliminaries

The Out-turn of work executed by each party during the field operations of the official year 1862-63 *is shown in the following Abstract :—*

Statistics.	Kashmir Series.	Coast Series.	Sutlej Series.	East Calcutta Longtdal. Series.	Rahoon Meridional Series.	Eastern Frontier Series.	Bombay Party.	Total Out-turn of Work.
Principal Triangles,	...	19	29	4	13	16	32	113
Average error of Principal Triangles in seconds,	...	0.94	0″.43	0″.44	0″.46	0″.43	0″.89	0″.65 average.
Observed Azimuths,	...	1	1	..	2	...	1	5
Secondary Triangles with all 3 Angles observed,	...	10	132	...	16	...	32	190
Area of Principal Triangulation, square miles,	..	256	1366	220	1603	884	6625	10,954
„ Secondary Triangulation,	10,500	...	4816	...	950	263	1510	18,139
„ Topographically Surveyed, scale 4 miles = 1 inch, square miles,	10,400	...	...	...	...	...	...	10,400
Intersected Points,	...	12	112	...	18	22	110	274
Length of Principal Triangulation in miles,	...	...	112	20	69	49	260	490
„ Secondary ditto,	...	...	340	...	72	...	100	512
Miles of Rays cleared between Principal Stations,	...	...	300	253	159	...	...	712
Towers built for Principal Stations,	...	...	11	5	5	..	2	23
Platforms ditto,	...	12	...	...	6	17	44	79
Platforms built for Secondary Stations,	...	...	95	...	...	...	...	95
Length of Triangulation laid out in advance in miles,	...	...	...	45	...	77	150	272
Principal Stations selected in advance,	...	...	...	8	...	17	36	61

for the eventual calculations are being carefully elaborated by Lieutenant Herschel, to whom I am indebted for numerous very valuable suggestions, and for co-operation as cordial as it has been unintermittent.

While the practical operations of this department may be confidently pronounced to be of a superior order to similar operations in any other part of the globe, it must, on the other hand, be admitted, that the theoretical applications, for the reduction of the triangulation, have not kept pace with recent improvements in geodetical science, which have been introduced into some European Surveys. The method which has hitherto been employed for reducing the observed angles, so as to satisfy all the equations of condition of each figure, though a great improvement on any previous method, has had, in its turn, to give way to the subsequently discovered method of minimum squares. The algebraical solution of the equations necessary to satisfy the condition that the sum of the squares of the errors shall be a minimum, is by no means difficult, but hitherto there has been no practical adaptation of it in this Survey, chiefly owing to the pressure of other and more urgent business, on those alone capable of dealing with the subject. Much progress has, however, been recently made in this direction, and I am indebted to Lieutenant Herschel for devising methods of calculation, which will enable the reduction of our figures to be effected, according to the new and rigorous system, by native computers possessing little more than a knowledge of arithmetic, with even greater facility than the less refined methods of reduction, which have hitherto been employed.

The drawing office has been chiefly employed in compiling maps of the dominions subject to the Maharajah of Kashmir, from the plane table sheets sent in by Captain Montgomerie. A new Chart of the Triangulation of this Survey, up to date, has also been prepared, and a Chart to illustrate the volume of Tables of Heights recently published; both these Charts were lithographed in the office of the Surveyor General, Calcutta. Nine original preliminary Charts of the triangulation, in various parts of India, have been prepared, in duplicate, for the use of the Surveyor General's Office, and the Geographer to the Right Hon. the Secretary of State for India. The Photographic apparatus is also being usefully employed in copying and reducing maps, and in furnishing preliminary copies for current use, until the

originals are engraved and published. Owing, however, to the small establishments at my disposal, the photography is necessarily restricted to the short period of the recess of the Kashmir Party, three to four months, when the services of our best photographer, Captain Melville, are available for their management.

In the Instrumental Department, great advantages may be expected by the appointment recently made by the Right Hon. the Secretary of State for India, of an officer, Colonel Strange, to superintend the construction of the new great Theodolite, and various astronomical instruments, which are being prepared in England for this department. When they are received in India, we shall be in a position to undertake the necessary operations for ascertaining our Longitudes, in connection with the Observatory at Greenwich, by means of the Electric Telegraph, which is now brought across from the Mediterranean to India.

On the Antiquities of Guzerat.—*By Captain* H. Mackenzie.

(Communicated by the Punjab Auxiliary Committee of the Asiatic Society.)

[*Received 16th February*, 1864.]

Guzerat City and Fort.—There are few antiquities in this district and of these few, little is known. Guzerat itself is considered to be of great antiquity: a town had existed here in former ages. I have not heard of any antique coins having been found in Guzerat itself, by which any perfectly trustworthy dates might be fixed, but there seems no reason to doubt that it was a place of some importance prior to Greek invasion. A Hindoo Raja named Raja Buchanpal, a Soorujbunsee, who emigrated from the lower Gangetic Doab to the Punjab, is said to have first built a city here, and called it Oodanuggree, the Everlasting or Sweet Smelling City. It is not known when this city ceased to exist, but it is recorded that in Sumbut 175 or 1740 years ago, Rance Guzran, wife of Raja Budr Sain, (son of Raja Risaloo of Sealkote) rebuilt the city, and called it Guzran Nuggree. This too passed away. In Sumbut 1350, Sultan Mahmud Guzniwalla laid it waste, and it seems to have remained so until 285 years afterwards, when the Emperor Akbur Shah chose the ancient mound as the site for a stronghold.

The year 996 Hijree, A. D. 1580, is fixed upon as the date of its erection. It seems not improbable that the Emperor Shere Shah may have had a hand in it at an early period; for, after building the fortress of Rhotas, he is reported to have taken much pains to settle this part of the country, so long disturbed by the contumacy of the Ghukkers. In those days there was no stronghold in the Ghuj Doab to mark the Imperial power, and it was the high road between Dehli and Cabul. Thus the position as well as the features of the locality were favourable. The Emperor therefore decided to build a fortress on the present site of Guzerat. The story goes on to say that according to the old Asiatic principle "*Minuk az Sirkar*," "*Arud az Bazar*," the Emperor proposed that the inhabitants of the country should bear half the expense. But the Jats, in whose section of the Doab it was situated, objected, and the Emperor was obliged to turn for assistance to the Goojurs who inhabited the neighbouring country to the west. The sum required was one lakh and a quarter, but the idea of having a Goojur Fort in the country of the Jats was so tempting, that the Goojurs agreed to raise the money. Futty Mahomed Chondra of Varaichanwalla, a village near Dingah, took the lead in the matter, but the cash was advanced by Adum, a wealthy Goojur of Dingah. This man, however, was so *unlettered* that he could only give the cash by measure, and he accordingly meted it out in a *Tossa* measure. His descendants are known to this day, as the Tossa division of Goojurs and the names of the villages they own and inhabit, all have the prefix of Tossa, thus Tossa Oosman, Tossa Adum, &c. &c.

The fort was thus built with the assistance of the Goojurs and called conjointly after them and the Emperor "Goojerat Akberabad." This so vexed the Jats that they soon after sent a deputation to the Emperor at Dehli, and tried to induce him to change the name. But the Emperor refused to do so, and only consented to mark off their country as a separate Turuf with any name the Jats might choose to give it. They chose the name of Herat, from the Persian province of that name being their real or supposed place of origin. The upper part of the Doab was therefore henceforth divided into the two Turufs; Herat of the Jats and Goojerat of the Goojurs, either of which will be found specified in almost all old documents concerning lands and the rights thereto.

The fort of those days is now hardly traceable, for it was renewed on a large scale in the early days of Sikh rule, by Sirdar Goojur Singh. The usual Imperial adjuncts, however, of a Baolee, Musjid and Hummaam, or at least the first and last, still exist and are in use at the present time. The fort is now much hemmed in by houses and streets. Its walls are 20 to 35 feet in height; it has only two entrances, and would still prove a considerable defence against an unscientific enemy.

The place grew in importance as time went on, but chiefly during the reign of the Emperor Shah Jehan. It then happened that a Pír of great virtue and sanctity, named Shah Dowla, took up his residence here. As the offerings made to him were large, so was his expenditure lavish, and a good deal was laid out on the improvement of the town and suburbs. There are yet to be seen the remains of a viaduct built of brick arches, and which seem to have extended from the north to the north east of the city, but whose use is not very apparent.

Hailan.—There are some extensive, and as reputed, very old ruins at Hailan, but nothing is known to determine their former history with any exactness. Some coins have been picked up among the ruins bearing the date of the 8th century Hijree, but nothing earlier than the Mahomedan times has been discovered. There is a large tomb still in very good order. Slabs are let into the walls bearing inscriptions. It appears to be the Tomb of Mirza Shaik Ullee Beg, an Ameer of the Emperor Akbur, who was killed in an encounter with the Ghukkurs; it is dated 999 Hijree. He founded a village close to Hailan, still called after him, Shaikh Ulleepoor, and possessed by his Mogul descendants.

Patu Kothee.—This is a very old ruin situated on the banks of the Jaba Nullah, at the foot of the Pubbee in Zail *Kurriahe.* The natives can give no information of its origin or use. It is of no great extent, but is reputed to be part of an old, perhaps buried city; the bricks are of a large model, one foot square and three inches thick, such as are never found in buildings posterior to Mahomedan rule, and very finely burnt; unfortunately no researches hitherto have succeeded in finding inscriptions of any kind. The bricks have often a mark in them as if described with the finger round the thumb as a pivot.

Russool.—Russool presents some vestiges of antiquity. An old mosque here contained an inscription commemorating its erection. The date was read as 1000 Hijree or thereabouts. It was placed in the Crystal Palace by Mr. Edward Clive Bayley.

Islamghur.—Islamghur is on a very high and imposing mound, which must be very ancient. It is said to have been the head quarters of the large chourassee of villages belonging to the Varaich Jats; in later times it was converted into a stronghold. The chief Chowdrees of the Varaiches have their residence and possessions in Jelalpoor to which Islamghur is close, but the latter is situated within the limits of the adjacent village of Koolachour.

Moong.—Moong is a very old place, it is very prolific in coins of later Indo-Greek kings, Azas, and the great (nameless) saviour king of kings, particularly small copper coins.

Khawaspore Serai.—The route to Cabul through the district has still the remains of the Serais and Baolees erected by the Mahomedan Emperors. The Serai at Khawaspoor was built by Suku Khawas Khan in the year 952 Hijree. Khawas Khan was a man of power in the service of the Emperors Shere Shah and his son Selim Shah. His mother was a slave girl in the former Emperor's seraglio, and he himself was married by the Emperor to the daughter of a Ghukkur chief, and deputed to govern this part of the empire. He immortalized his later master by converting the Bhutiaras of the Serai, and dubbing them Suleem Shahees or Islamshahees, which appellation the Maachus of the village and its neighbourhood give to their caste to the present day.

At Kharian there are two very large Baolees. Both are said to have been built at the same time, and their very different appearances now, are accounted for by the western one having been very thoroughly repaired by Sirdar Lena Singh. The eastern Baolee is in its original state, built of stones now very much worn; over the top of the steps is a massive dome with an inscription. It simply records the completion of the work in the month of Ramzan 1013 Hijree, in the reign of Akbar, who ordered it to be built by Jutyoollah son of Hajee Habeeboollah, and that it cost 11,000 Akburee Rupees, and it concludes with a prayer that the maker's sins be forgiven. Kharian bears the prefix of a Serai, but it does not appear that a Serai was ever

built here. It was a staging-place and the Baolees were provided but no Serai.

Serai Alumgeer.—The Serai at Nourungabad was built by the Emperor Aurungzebe, who gave his title of Alumgeer to it. It is improperly called the Serai of Nourungabad which is a village half a mile distant, and altogether out of the Alumgeer lands, which were granted to certain Khutrees to preserve the Serai. But during the Sikh rule there was a cantonment at Nourungabad which properly accounts for the Serai becoming known by that name also.

Chowkundee and Alumgheer.—Besides the above there are no relics of the Imperial sway, except the ruins of a hunting residence near Alumgheer in the upper part of the district. The ruined edifice still goes by the old Sanscrit derived name of Chowkundee. It was built by the Emperor Akbur Shah, in the 34th year of his reign, and was the first halting-place after crossing the Chenab, in the royal progresses from Dehli to Cashmere.

These Serais have long ceased to serve their purposes. After the decay of the empire, their utility was no longer appreciated: the materials were, to a large extent, appropriated to other purposes, and now the walls or their foundations only can be traced through the mass of plebeian habitations which cover their sites, but their remains attest their substantial construction and are still monuments of a large-handed wisdom and public beneficence, which found no imitators in the Sikh or Duranee governments which succeeded.

Memorandum on the Question of British Trade with Western China viâ Burmah.—By Dr. C. Williams.

[*Received 24th June*, 1864.] [*Read 7th September*, 1864.]

The subject appears to naturally divide itself into the consideration of several sets of circumstances that may be conveniently classified under the following heads:

1st. The political state of the several countries between the Bay of Bengal and Central China;

2nd. The Physical Geography of the district proposed to be traversed by the various lines of communication;

3rd. Their commercial condition and capabilities including population, products, former and existing trade, &c.;

4th. The conclusion from consideration of the above three subjects, as to which is the most desirable and practicable route.

I.—Political.

Pegu, Martaban and Tenasserim, with their rivers and ports, being permanent portions of British territory, and all therefore but insuperable physical obstacles, being under the direct control of the British authorities, it is needless to consider their political condition.

The state of the political relations of Burmah Proper with the British Government of India, up to the end of 1862, has, I believe, had much to do with the direction which public attention has taken in looking for the desired opening of Western China.

Up to that time, the Burmese Government, unwilling to acknowledge in any way the stubborn fact of the province of Pegu being British territory, had obstinately rejected the repeated overtures of the Indian Government to the settlement of a permanent peace, and had in fact behaved towards that Government in a spirit of passive hostility.

At the time of first turning my thoughts to a career in Burmah, and especially in Upper Burmah, one of the prospects most distinctly in my view, was that of the old route to China by the Irrawaddy being re-opened and made available to British commerce, by an alteration of the then existing feelings and intentions of the Burman Government towards the British. This is not the place to enter into a history of the changes gradually produced in the minds of the chief authorities of Burmah Proper. Suffice it to note that the political

position, as bearing on this question, is now totally different from what it was during the decade succeeding the last Burman war. The Envoy of the Viceroy and Governor-General has negotiated a treaty, wherein the British and Burmese Governments are declared friends, and trade in and through Upper Burmah is freely thrown open to British mercantile enterprize. Arrangements are there made by which our direct trade with China may be carried on through Upper Burmah without any harassing restrictions, and subject only to a transit due of 1 per cent. ad valorem, on Chinese exports, and nil on imports. A British agent resides at the Burmese court, acknowledged and conferred with by the Burmese Government, under the title in their own language of "Agent to the English minister,"—the Burmese translation of Chief Commissioner referring to his political capacity of agent to the Governor-General, being "Ayebamg Woongyee," a term only applied among themselves to the minister who has the conduct of political affairs, which minister is invariably the chief Woongyee or Vizier,—whose functions are precisely those of a Consul and Chargé d'affaires, taking his instructions from the Chief Commissioner of British Burmah.

No one acquainted with the history of the former relations between the Burmese and British Governments, can fail to see in this, the proof that there has taken place within the last three years, a substantial revolution in the political position of Upper Burmah, and that in looking for routes into Western China, that country must be now regarded in a light not only different from what was formerly the true one, but almost the very opposite. There is no longer a hostile Government shutting up its territory and excluding British trade. The Burman Government is now a friendly one, *inviting* British trade, and not only willing to open to it the high way to China, but fully alive to the advantages that commerce through its territory would confer both on the monarch and the people.

Burmah Proper is no longer a barrier, but a gangway, open to the use of whoever will avail themselves of it.

To the East and North-East of the frontier of British Burmah, hanging about, so to speak, the lower and middle Salween, are several tribes of various Karen races, some of them acknowledging British, others Burman Suzerainty, and others not only really, but nominally quite independent.

Their character is as wild as the mountains they inhabit. The converts to Christianity, extraordinary as has been the success of Dr. and Mrs. Mason among these tribes, are as yet, comparatively too few to alter the general character of the Karen chiefs and people.

4. Passing over the Salween valley, and approaching the northern portions of the Cambodia, there are found Shan States tributary to Burmah, and acknowledging their vassalage, with, in reality, the inverse ratio of their distance from the Burmese capital. To the west of these Shan States are others whose comparative proximity to the Irrawaddy makes them more substantially submissive to the Burmese Government. The Salween may be said to be the line westwards of which the sovereignty is real, while eastwards it is merely nominal. The Tsaubwas, or hereditary rulers of these various states, are independent of each other, and it is this fact with the frequent strifes between them, and even between the several members of one Tsaubwa's family, that explains the success of the Burman policy in regard to them, which is simply "divide et impera."

Crossing the Cambodia, other Shan States are met with, tributary to China, and finally the north boundary of Siamese territory, the west of Annam, and the southern limits of China Proper, are separated by Shans whose allegiance to either of these three Powers, is very ill-defined.

The most important matter, perhaps, for consideration in this division, is the position of the part of China we desire to reach, viz. Yunan and Sechuen.

Unfortunately the province of Yunan has for some eight years past been the scene of a fierce struggle between the orthodox Chinese and Tartar officials on the one hand, and the Mohammedan insurgents on the other. To quote my letters dated from Bamo in 1863—"The Mussulman Chinese, or '*Pansees*,' as they are called, seem to have first suffered what they deemed oppression and persecution. The fierce tenets of their faith soon led them to resistance, and being but a handful in the midst of their Buddhist fellow-subjects, they had to fly *en masse* to the jungles and hills, whence they commenced a dacoity-war on the Chinese towns and villages. The Mussulmans were bound together by their common peril, and afforded another instance of the strengthening influence of a vigorous religious belief, by the success they everywhere met with in combating their numerous, but

enervated enemies. These successes soon attracted to their side a crowd of the innumerable class who had nothing to lose, and were anxious to gain. To these the Pansees gave ample encouragement by abandoning to pillage every conquered town. Not numbering among themselves more than 20,000 fighting men, they have now at their command, armies amounting to between two and three hundred thousand, of Chinese, Shans, and people of the wild hill tribes, Kahkyens, etc. The war has become a struggle that has devastated the country, destroyed commerce, and rendered life and property utterly insecure. The captured cities were dealt with in truly oriental style, of which particulars are needless. The conquerors seem to have restrained themselves from debauchery in order the better to handle the hordes of villains at their command. The Pekin authorities, it is well known, have had enough on their hands elsewhere, and seem to have made no efforts to support the local government. In Western Yunan, at least, this has been, in consequence, completely upset, and the Pansees have formed a regular government of their own to replace it. The seat of this new Mussulman power is at *Tali*, the second city of the province. In that city now resides the Pansee king. The system of government is, as yet, purely military, the country being under the roughest kind of martial law. The king is called *Tuwinseu;* his chief officer, *Sophutyangin*, has the management of affairs at Momien, a large Chinese town close to the Shan States, west of Yunan; and another commander, Tawsuntutu, is stationed at Yunzehan. Many of the highest commands are given to Chinese and Shans who have committed themselves to their side!*

From conversations at Bammó and Mandelay, with various persons more or less the accredited agents of the Pansee government, I and also convinced that it is the earnest desire of that government to re-open the trade with Burmah. Through these same agents the Pansee authorities will have also been enlightened as to the purely commercial views, the British authorities have in regard to their territories, and the solid advantages that will accrue to them if they facilitate the opening of the routes and afford due protection to the Chinese traders.

* From information I have procured during the past year, I cannot but think that this Pansee ascendancy in Western Yunan is for the present, or until the Emperor of China can spare an overwhelming force to destroy it, firmly established.

The Province of Seehmen not less important to us than Yunan, is, as far as I am aware, unaffected either by the Taiping or the Pansee rebellion.

To the West of Yunan Proper is a small cluster of Shan towns under their several hereditary chiefs or Tsaubwas, commonly called the Shan *Shipyee* or eight Shan States. They are, beginning at the North, Maintee, Sanda, Mainla, Hossa, Lassa, Mowun, Maingmo and Kaingma. These formerly belonged to the Burman Empire, but were lost in the time of Shingpyu Shing, about 1769. On the Pansee rebellion breaking out, the insurgents did not find it difficult to obtain partizans among the disputants, invariably in the families of the hereditary Shan Tsaubwas. By such influence they contrived to get a peaceable submission to their sovereignty in place of the Chinese; and many of the Shan chiefs are in their service, the Nantia Tsaubwa, for instance, who is a Pansee officer under the name of *Taututu*, and the Lookhyang Tsaubwa *Siyintutu*. The temptation to oppression was, however, too strong, and several of the Shan towns, unable to put up with the penalties of Mussulman domination, have again thrown off their allegiance to their new masters and assisted the Chinese commanders still holding out against the Pansee. At Bammó I often conversed with inhabitants of these Shan districts and gathered from what they told me that any settlement would be welcome to them that would save them from being a prey to two enemies at once.

Not unnaturally the Burmese government has been led to think of resuming its former position in reference to these Shan States, important for their teeming population, rich lands, and situation, and I am informed on the highest authority, that some of the Shan towns have invited the king of Burmah to take them into his dominions and under his protection. As "quieta non movere" is, however, a maxim now in much force in Burman policy, it is not probable Burman dominions will grow in that direction. Were these Provinces, however, to become Burman territory, the political obstacles to communication would be very much diminished, not only by so much more of the route being under friendly Burman rule, but by the Kakhyen tribes on the hills, being then pinched in between Burman authority on both sides, and thus more easily compelled to respect the lives and property of travellers, and cease their mischievous hindrances to trade across their mountains.

The Kakhyens above alluded to are a portion of the vast horde of Singphos that inhabit the mountainous districts of Northern Assam, and stretch round the North of Burmah into Western China. These extend not only all along the Northern frontiers, but dip down Southward wherever the mountain ranges lead them, even to half way between Bammó and the capital. They have ousted many Shan tribes, particularly "Paloungs," from the hill districts, and wherever they appear, they assume the same character of lords of all they can reach, and are only to be appeased by some form of black mail. In proportion as their locations are within reach of Burman troops, the chiefs acknowledge themselves vassals of the Burmese king. How strong the tie was even in vigorous Tharrawaddy's time, may be judged of from an anecdote. One of the chiefs of the hills north of Shoaygoo was honoured with special dignity by that king whose golden foot he had worshipped at the capital itself; but having some few years afterwards incurred the displeasure of the Burman ministers, they ordered the local governor to call him, take away his chieftainship and give it to another. The chief came to Shoaygoo, but on hearing why he had been sent for, spat on the ground, saying: "When I take that spittle again into my mouth, the king may take back the rank he gave me," and returned to his hills and to his Tsaubwaship, ruling with increased, rather than diminished prestige.

The tie is at present still more slender. The Kakhyens, as the Burmese call these "Singphos" levy black mail even to within six miles of Bammó, the seat of a Burman governor of the rank of a Woongyee. They inspire such terror, that in the neighbouring plains, no Burman nor Shan will venture alone, or even in company, unarmed along the roads within their reach.

The communities I have now to remark on, inhabiting the range of hills between the Bammó and Momeit valley, and the plains and valleys of the eight Shan States, are identical in race and language with the Singphos of Assam. They belong to various tribes; they obey no common authority, but are divided into numerous little clans, each with its own chief, and each perfectly independent of the others. Some of these chiefs rule a country of a thousand families, others but a few score. They are frequently at feud with one another, and are habitually ready for strife. Their people invariably carry arms, and have among them great numbers of matchlocks of Chinese and their own manufacture.

9. The Burmese frontier is still officially supposed to be on the east side of these Kakhyen hills, and but a few years ago, there were Burmese and Chinese stockades on the western and eastern sides of a little stream, the Lueyline, that marked the limit between the respective territories. Although this outpost has been withdrawn, and the Burmese, now, have no troops further East than Bammó, the Kakhyen chiefs still acknowledge in theory the Burmese Suzerainty, those near Bammó coming into the town at the call of the Governor, and, to a certain extent, obeying his orders.

The Shan villagers along the Taping creek assured me that fifty years ago, there were scarcely any Kakhyens in those hills, but peaceful Paloungs, who have been gradually displaced by them. Signs of former population and extensive culture obtrude themselves upon the attention of the traveller, and corroborate the native assertion that the Kakhyen nuisance is one of only recent growth. The inhabitants very naturally, and, perhaps very justly, throw the blame on the Burman government, whose local officials, careful only for the revenue of to-day, neglect the duty of protecting the people, and leave them, their lands and their property, a prey to these wild depredators whose power for mischief might be not only curtailed, but effectually destroyed, were a little timely energy used towards them.

In the late conflicts between the Chinese and the Pansees, these Kakhyens have often mixed. More generally favourable to the Pansees because they are rebels against the Chinese, who used often to punish them, they have helped in their very rough way either side, according as their immediate interests prompted. Their feelings towards the Chinese may be imagined from what the Chinese themselves told me. "In old times" said they "the Kakhyens on our side of the frontier, were much afraid of the Chinese officials. How many villages have we burnt and how many men have we killed, to punish their robberies of our caravans. Several thousand men would go up and surround a village which had committed some outrage, and burn and destroy every soul and everything; but still after a few months a fresh village would spring up near the same spot, and it would be as bad as the former."

With some of the chiefs of the Kakhyens, on the mountains east of Bammó and Taiping, I became acquainted; and there is no doubt but that these chiefs are keenly alive to the fact, that, not only are they

the masters of the passes into China, but unless these passes are made use of, they can reap no advantage from them. The language of one of them serves as a sign of the feelings of all: "I will make a road across my district and will conduct any number of merchants safely into China; no other route shall be like it; and I don't care whether they be English, Burmese or Chinese. I want them through my district; and will guarantee that nothing shall happen to them." They, in fact, look on the routes as sources of income, and would be very glad to assist in making them safe and easy, provided they saw it to their advantage to do so; if, in short, tolls were secured to them. They care for no one party or nation more than another: the best payers will have their best good will.

It may be worth while remarking here that the general population of Northern Burmah, above Miadoung, is Shan. There are also along the Upper Defile *Pwons*, and to the west of Katha, *Kadoos*. Both these races, as well as the Shans, are Buddhists, and bear a good character for quiet, agricultural and trading industry. Their languages have a great many words identical with the Kakhyens, Burmans and Shans.

II.—Physical.

1. The Salween, splendid as the channel is near its mouth, unfortunately refuses to permit of navigation beyond a few miles above Maulmain, where commences a series of rapids and rocky passages that it is scarcely to be hoped, can be overcome or avoided by any engineering operations for which either Government or private capitalists could prudently provide the outlay.

2. The route viâ Shoaygyeen to the Salween and along its valley to near Kiangtungye, is so filled with well known obstacles, in the way of mountain ranges, made worse by the character of the Karen tribes inhabiting many of them, that it is unnecessary to speak of it.

North of our Pegu frontier is a great plateau, having a few isolated mountains and some ridges of hills, neither high, continuous nor precipitous. No physical difficulty, in fact, opposes the formation of any description of road across this plain from the Irrawaddy to the Shan mountains. This fact has invited much attention to this route, and up to that point, it is certainly most attractive. But what lies beyond? The very next step is an ascent of, at least 3500 feet above the plain. As far as I am aware, nature has provided no pass or

slope that the most enterprising engineer would think of attempting to make available to a Railway Company who wished to make their undertaking pay. The passes by which the natives go from the plains to the high lands are few, and are all reported to be difficult and tedious, even for the pack animals that now form the only means of transit for goods. The ascent once accomplished, hills and undulating ground at a general level of about 3000 feet continue to be the features of the country till the valley of the Salween is reached. Here a descent is to be accomplished, and if the Salween be navigable, the difficulties are over. But if, as I fear and expect, that river is not available for either steamer or extensive boat traffic, another ascent has to be made on the other side of the Salween, and a still less known series of mountain ranges and high lands must be traversed to reach the Cambodia. This, a much larger river than the Salween, has the character in Upper Burmah at least, of being like it, too rapid and too rocky to serve as a highway of trade. It is at any rate from just below Kiang Hunggyee to Kyangtsen, (*i. e.* from Lat. 20° 30′ to 22°) full of rapids, over which only small boats can be dragged safely.

Beyond the Cambodia, are mountains again, and no one knows what difficulties lie between that river and Esmok, wherever that may be, so that, after all, the route ends in the same unknown region and reaches the same undesirable goal as that advocated by Capt. Sprye.

It has been proposed as the best route by H. M. the king of Burmah himself, to start from the river at the capital and follow the ancient trade route of Thongze, Theebo and Theinnee ; and, as far as I am in a position to judge, I think this route to be freer from physical obstacles than any more Southern one. The Irrawaddy conducts you to within 20 miles of the passes up into the Shan plateau. These passes, however, I believe to be quite impracticable for either rail or tramway. In 1861 passing along the westernmost ridges of the mountains where the Theinnee route pierces them, I had to go by paths at a height of over 5,000 feet (by barometer) above the river flats. I have been up and down the western face of the range in that neighbourhood by four different routes, each of them precipitous and not only at present impracticable, but, as far as one, without engineering experience, can judge, such that it appears impossible to make them available for any kind of rail or even tramway, without an expenditure

far beyond what it is possible to suppose can be made reasonably devoted to the purpose. The ascent once accomplished, however, an undulating and hilly tract of country permits of the easy extension of the road to Theinnee. From Theinnee it is, I believe, an almost uninterrupted plain to the very central point of Yunan city. Other routes are also open, viz., straight to Tali without passing through Yunchan—or again through Manyo to Maingmó and on by the further portion of the route to be next spoken of.

5. From Rangoon to the Burmese capital, the Irrawaddy river is known to be navigable and to be a good channel for steamer traffic. No steamer has, however, ascended beyond the capital further than Tsingoo, above which commences the lowest of the three defiles through which the great river passes in the upper half of its course, and it has been generally regarded as closed to steam traffic beyond that point. On my way up and down the river last year, I was naturally led to note most carefully everything that I could observe, bearing on this question, and took great pains in making such a sketch plan or survey as would serve as a guide to the river for intending navigators. All the obstacles, narrows, rocks, &c., in the way of safety to steam traffic, were there carefully noted, and I cannot do better here than copy the general observations I then made on this portion of the Irrawaddy.

"The chief characteristics of the Irrawaddy above the capital, are the three defiles, each of which has distinct features of its own. Above and below them, the river maintains much the same character as between Rangoon and Ava. In these open parts it may be laid down as a general rule, that navigation meets with difficulties in proportion to the breadth of the river. In the long reaches below Tagoung and in shorter portions equally well defined, where the breadth scarcely varies, and the banks are almost parallel, the channel may be taken anywhere between them. Where, however, the river spreads out into a varying expanse of stream, sandbank and island, the current sometimes fierce and to be overcome with difficulty, at other times scarcely moving; here several fathoms deep, there but a few feet or even inches, the relative positions of the deep and shallow being changed, often entirely reversed in a season, the navigation is intricate and difficult, sometimes even for the native boatmen. Such are the broad portions of the river near Powa, from Moale to Khyannyat—from Tongne to below Thigaim—from Thigaim

to Shoaggoo—and between Sawnddy and the upper defile. Still, even in these parts boats drawing five and six feet of water can always find passage and therefore with the aid of pilots or masters who have "an eye for water," steamers could undoubtedly do so as well.

"The two defiles met with below Bammó are both remarkable for the contrast they present to the other parts of the river in their contracted breadth, their great depth and except in the freshes, their almost imperceptible surface current. The lower defile, extending from Singoo to Malé, has an average breadth of about one-fourth of a mile, the banks are wooded to below the high flood-mark and slope down from the hills whose steep sides form the valley of the defile, so as to afford a continuous series of pretty views, without any grand or imposing scenery.

"The second defile, much shorter than the lower one, is also of another character; approaching it from below, the narrowing of the river towards its mouth is gradual, but before entering it the high hills led one to expect that once within, the scenery would be something totally different from that seen either in the open reaches of the river, or in the lower defile. There was little room for disappointment. Soon hard limestone rocks mottled and striped with calcspar veins, formed the boundaries of the river, scarce a third of a mile across. As the channel narrowed still further, these rocks give place to bold and precipitous hills rising from the water's edge, clothed, where not quite perpendicular, by thick masses of forest foliage,—and then to magnificent precipices, looking naked and defiant over the placid stream, and making the rugged jungle beside them appear beautifully soft.

"The most lofty of these cliffs is about a third of its length from the upper or eastern end of the defile. Overhanging the deep but quiet stream is a rough mass of rock about fifty feet in height, topped, it is needless to say, by a little pagoda, that peeps out from between the branches of some shrubs that have crept up from the jungle below, as if to look up and down the river. Close behind this rock, there rises straight up with one unbroken front, the face of half a mountain of which one cannot help asking 'Who or what has split it in two to let the river pass?' One involuntarily looks to the other side for the remaining half, but there lofty mountains form an irregular amphitheatre, with smaller hills piled one on another, leading up to them from the river side. The face of the precipice, perpendicular as

it is, cannot defy a few hardy climbing shrubs holding on to the lines of crevices and ledges between the strata of the limestone. Their roots and winding stems seem from below to be simply stuck against the rock. This imposing cliff is of the shape of a huge wedge, lying on its side, with one sloping face to the east, the other to the south, and each exposing an immense expanse of reddish grey limestone, streaked with interlacing white veins of calcspar.

"The great Irrawaddy itself seemed awed into quiet and humble limits as it wound beneath the cliffs of this defile. Actually not more than 200 and 300 yards wide, it looked but 100. The surface tranquil, with no perceptible current, the mighty stream of one of the finest rivers in the world, seemed to hide itself, and pass the mountain in the modest shape of a quiet creek.

"Beneath the surface, however, the current is as strong and rapid as it is quiet and gentle above, and it instantly drew the lead from its perpendicular.

"As to the depth, close to the face of one of the cliffs, the ten-fathom line could not reach ground; but at another spot I found bottom near the centre of the stream at eight fathoms.

"At one of the narrowest parts, I found the breadth of the river to be 970 feet, though judging from the eye, I could not believe it more than 150 yards. This defile is thus narrower, shorter, and more winding than the lower, and affords much more picturesque and imposing scenery. Neither the one nor the other, however, can be any obstacle to steam traffic. Except in the freshes, indeed, these are the safest, and easiest parts of the whole river. The spring rises, it is true, are said to cause very fierce currents, and it is not unfrequent that boats are lost in the effort to stem them. But steamers of not too great length and of sufficient power, would avoid the dangers that threaten boats poled and towed along the banks, and if able to conquer the flood stream, could ascend safely in all seasons.

"The few rocks found in the stream and those projecting from the general line of the banks, are noted in the sketch plan of the river. The most serious of these are at *Khyankmo* above Thigame, and just below *Koung-toung*, above the second defile. In both cases, however, there is clear passage for steamers, as indicated in the plan.

"The general course of the river, described as traced from below, is northwards to Katha and then eastwards, (including several bends to

the north-east and south-east,) to just below Bammó, where it again turns northwards, and continues in that direction as far as it has been explored. About ten miles above Bammó commences the Upper or 1st defile, of which it is sufficient here to note, that its irregular banks of limestone, flint and serpentine, would alone make steam navigation extremely dangerous; but the many places where boulders and islands composed of the latter two rocks stand out in the stream, forming a labyrinth of "Scyllas and Charybdises," make it quite impossible. At one spot where the whole Irrawaddy is literally poured through a gorge 50 yards in breadth, the labour and danger of getting a boat up round the jutting rock, even at the time of the slackest current, is very great, and the sensation of peril on being shot through the middle of it, when the river is rising, into the midst of the whirlpools that play below, is one that, once experienced, can certainly never be forgotten."

Two tributaries of the great river, from their position rather than their size, are also worth noticing here. One, the Shoaylee, which comes down from Yunan, close by *Maingmó*, and after traversing the Kakhyen hills, meanders through the Momeit plain, to fall into the Irrawaddy below Bammó, at about one-third of the distance between that place and Mandelay.

Could the passage of that river be taken as a proof that the Kakhyen hills are pierced by a valley, however tortuous, that it would be possible to take advantage of for a great commercial road of any kind, nothing would be more promising than the attempt to make such a road from, say Tagoung by Momeit to the Shoaylee valley, and to follow its course on by Maingmó into Western Yunan.

Unfortunately, however, I could get no tidings of such a valley. Quoting my journal again: "The accounts I get of the Shoaylee in its passage through the Kakhyen hills represent it as a succession of rapids, falls and rocky torrents, through impassable ravines. Once in the plains, however, it becomes a quiet river with numerous Shan villages on its banks. A few miles up from the mouth of the river, beyond which, time would not allow of my going, I find it at this season, (April) an even current of water, of a depth varying from a few inches to over 12 feet, running between banks two and three hundred yards apart, with marks of rise of water in the flood, of twenty feet or more above the present level. It is said to continue of this character

for one day's journey, and then for five days to be a most intricate series of shallows, islands, channels, and sandbanks, to where the Momeit river falls into it. One day leads to Momeit town, and at two or three days' boat journey from the junction, the Kakhyen mountains are met with, and further progress stopped by the rocks of the ravines from which the river issues."

In the dry season, boats drawing three feet can ascend to Momeit. In the summer floods, the largest boats, of 80 and 100 tons can go up for two or three days' journey beyond the junction of the Momeit stream. The river is so winding however, that nine days' journey by the river can be accomplished in four by land, and except for rafts of timber, bamboos and pickled tea, and boats with heavy cargoes, the river is not much used, the land routes along its course being much more convenient for the lighter traffic. The lands near its banks are very low, are flooded in the rains, and reported to be very unhealthy. I may mention too that Kakhyens are "about," even to within a few miles of its mouth. They come down from the hills, and burn the jungle lands on the plains for "Toungya" cultivation, and make all the roads unsafe.

The other river is the Taping. This too comes from Yunan through the same ranges of mountains, and falls into the Irrawaddy. Like the Shoaylee, it is worthless as a guide. I went up it as far as a boat could possibly go, except in the driest season. Issuing from the hills, about 15 miles E. N. E. of Bammó, near the site of the ancient Shan town of Tsempenagó, or the "old Bammó," it is so far a quiet river, of a breadth varying from 100 yards to half a mile, (and now and then enclosing islands, half a mile or more in length, between its channels,) and of depth sufficient even in the driest seasons to give passage the whole way to boats drawing two or three feet of water, and often showing no bottom at two fathoms. In the freshes it rises some 15 feet or more and overflows its banks; it takes a moderately winding course to reach the great river at Susecwah, a couple of miles north of Bammó.

At the point reached by my boat, a few miles within the defile by which the creek comes through the hills, I found the first of the rocky portions that make navigation impossible, and from the manner in which, at that season of the least water, the stream poured through between immense rocks of silicious mica schist, polished and burnished by the friction of the summer flood, I was convinced that if but a slight

rise were to take place, no boat could even approach where we then reached, much less go beyond. There was seen indeed more than enough to verify the description given by the Shans of the utter impossibility of using the stream for navigation. As to depth, we could reach no bottom at 12 feet, even between rocks only 6 or 8 feet apart. Below these rocks the river was like a long placid pool, at the bottom of a deep ravine whose sides were clothed with luxuriant jungle. It is about 50 yards broad, the current on the surface scarcely perceptible, but the depth must be great, for within three feet of the water's edge, the 12 feet pole could find no bottom. Immediately on leaving the hills, the river spreads itself and begins to form large sandbanks and islands between its banks as above noticed.

The mountains just spoken of are the next claimants to attention. I regret very much that I have only been a few miles among them. From what I saw at that partial close inspection, and from the neighbourhood of Bammó and Sauwaddy, and from the information I have gathered from various sources, I believe that they consist of an irregular triple range of hills composed of limestone, mica-schist, gneiss and other primary rocks, running down from the mountain chaos at the east end of the Himalayas, where the Irrawaddy has its sources, and forming the boundary wall, as it were, between the high lands of Yunan, and the valley of the Irrawaddy. On the north it joins the mountains of the first defile, and on the south is connected with those pierced by the second, and it is, I believe, continuous with the range that passes east of Mandelay, down through Karennee to Martaban. The general width of the range, opposite the Bammó basin, varies from thirty to fifty miles. The Irrawaddy slope, about 15 miles east of Bammó, is much deeper than that towards Yunan. The average height of the western ridges, I guessed to be about 2000 feet. The number of passes into and through them as shown by Map No. 2, confirms the belief suggested by their appearance, that they do not form any thing like the obstacles to transit that the more southern portions of the range do. They can be traversed, in fact, from the Bammó to the Yunan side in as little time as is required to merely to ascend from the plain opposite Ava to the plateau of the Shan country, by the Netteik Pass. Of the various routes marked in the Map No. 2, those from Ingtha to Wannim and from Monmouk to Lucylin, are the most used; but those to Maingmó have to traverse the least difficul-

ties, and I believe that there is more chance of finding a practicable breach for the charge of the iron horse between Sawuddy and Moungsun, than in any other direction.

As above noticed, the two rivers Taping and Shoaylee that pierce the range from east to west, are of no use as guides; even their tributaries render the ordinary routes impassable in the rainy season. None of these mountain streams, however, are of a breadth too great to be bridged in the simplest manner, and wherever bridges are required, there is both timber and stone in abundance, everywhere at hand.

Once across this range of hills the physical geography of the land, as far as we know of it, is not unfavourable to the construction of any kind of road. The Taping and Namwoon valley stretches north and south from Chanda and Mola to below Mowun. That of the Namoung or Shoaylee leads from Moungsun through fertile plains and by large Shan towns, among which are Maingmó and Secfan, to within forty miles of *Momien* on the left, and *Yunchan* on the right. As the regular Chinese trade route is there reached, it is not probable that any insuperable obstacles exist to carrying on the lines and making new bridges over the Shoaylee, and the much more important Salween and Cambodia, where they are already spanned by the Chinese iron suspension bridges.

I have also been informed by travellers who have been there, that from Moungsun there is an almost uninterrupted plain across to the city of Yunan, and that this direct route to that important capital passes over no mountains whatever.

III.—Commercial.

As to British Burmah it is unnecessary to do more than notice the fertility of the soil, its well-known production of rice and the paucity of its population.

Burmah Proper, however, requires more notice, not only from the extent to which it takes our manufactures in exchange for its own products, but also on account of its little known mineral wealth.

The total value of Exports from Upper to Lower Burmah in the year 1862-63, was in round numbers 43 lakhs of Rupees, of which 38½ lakhs' worth went down by the Irrawaddy. This amount included—Sesamum, oil and seed, 6 lakhs; raw cotton 4½ lakhs; jaggery 5½ lakhs; petroleum

1⅓ lakhs; cutch 1¼ lakhs; timber 1¼ lakhs; rubies 1 lakh; sticklack 1½ lakhs; gram 1 lakh; wheat 1½ lakhs, for the foreign markets or European consumption, and of native silk fabrics 4½ lakhs; cotton ditto over 2¼ lakhs; lacquered-ware over 2¼ lakhs; and pickled tea 1¼ lakhs, for consumption in British Burmah. Nearly all the products thus exported are grown below the capital. They might be increased, it may be said, indefinitely, by a more numerous population, sure of more protection and freedom to dispose of property, than unhappily at present obtains. Large tracts of land to the south and of still greater extent to the north of the capital, formerly producing cotton for the China market, are now abandoned and left uncultivated.

As to the mineral resources, there are three or four distinct places where coal crops out, from which good samples have been procured, and that promise to be the signs of extensive veins. These spots are not distant from the river. Copper is found, but I do not know of the ore being worth working. Iron of good quality is made from the Hematite found near the Paopadoung, N. E. of Sagham, and also near the Arracan mountains beyond Yan. I can also give my personal testimony to the fact that large deposits of the richest magnetic oxide exist in the ridges directly east of the capital, surrounded by limestone which may serve as flux, and forests, (not improbably also coal) which may afford fuel. I can also guarantee that this ore, though it has never been made use of, produces a steel of first rate quality, and I have reason to believe that it exists in abundance within a stone's throw of the banks of the Myit-Ngé. Lead, silver, gold, and precious stones are mineral products of Burmah Proper, well-known to be at present comparatively undeveloped sources of wealth. To these may be added bismuth, sulphur, marble, serpentine, amber, salt and limestone. The iron and the coal are, however, of more particular importance with reference to the question under consideration.

The population of Burmah Proper including the Cis-Salween Shan States, may be estimated at 4 millions, (a very small proportion of this —probably not more than one million—Burman). Already a great portion of this population wear clothes of English manufacture, imported from British Burmah, including 13 lakhs worth of silk and cotton piece goods, 1½ lakhs of woollen ditto, and 3¾ lakhs of cotton twist and yarn. It only requires a better communication and a lower import tariff to increase the number of customers to the whole

population. At present a kerchief sells at Bammó for quite double its price at Rangoon.

The people of the Shan States traversed by the proposed overland route, are also consumers of British manufactures. The Shan States are believed to be rich in mineral products; the lead and silver of Burmah are almost entirely the produce of mines in Burmah—Shan territories.

In the northern portion of Burmah are held annual fairs at several points on the Irrawaddy, where not only the Shans, Pwoons and Kadoos of the interior, but the Kakhyens of the mountains come to buy the wretched specimens of Birmingham manufacture and the inferior cotton and silk piece-goods that the native traders of the capital take up to those markets. The trade is very unsatisfactorily conducted. The sales of each trader are small, but the profits large; the articles, therefore, are very inferior and very dear. None of them have ever been exported to China, the Chinese themselves producing better at a less price. Another important article of trade in that direction is salt. It is exported from Bammó all around, all the tribes, wild and peaceable, being dependent on Burman salt, and great quantities find their way into Yunan. The average wholesale price at Bammó is about equal to a penny a pound.

The commercial state of the Kakhyens of the hills is very simple. In some parts they grow a little cotton, more than enough for their consumption; in others they depend on the Bammó markets. They make strong cotton fabrics for their own clothing, of very excellent quality, that certainly Manchester could not compete with in price. The present merely nominal value of labour explains this cheapness.

In these mountains, however, are at least two most important metals, *lead* and *silver*. A specimen of galena that I obtained from a spot where it occurs in abundance, but which has not been worked as a mine, contains according to the analysis of H. B. Medlicott, Esq., of the Geological Survey, "63 ozs., 14 dwts. 8 gr. *to the ton of lead, a very rich ore indeed.*" Bishop Bigandet also informs me that he heard of mercury being procurable within a few miles of the western slopes, near the Burmese village of *Tali* (vide Map No. 2).

The eight Shan States on the other side of the range are known to be thickly populated, and labour is there abundant and exceedingly cheap. At their southern end, in Burmese territory, near

Kaingma, is an extensive silver mine, known for ages, but recently abandoned from motives only comprehensible to those in the secret of Burman polities.

As to YUNAN itself, with its ten millions of population and 21 cities of the first order, it is now well known to be, in a commercial point of view, one of the most important provinces of China. In the extreme south are *copper* and perhaps *zinc*, and certainly the finest *tea* in the Chinese Empire. The middle and northern portions are still more rich, the minerals alone including *gold*, *silver*, *copper*, *iron*, *mercury*, *arsenic*, *lead* and *coal*. *Silk*, *tea*, *rhubarb*, *musk*, *hams*, *honey*, and many articles suited rather for the Burman than European market are also produced, and were formerly exported from this portion of the Province. The centre of trade in western Yunan is *Yungchan*, where are the head quarters of the great company that has had for so many years, in its hands, the whole trade with Burmah. All the above-mentioned articles are there traded in. TALI and YUNAN are still more considerable places of trade.

The next province, SECHUEN, is, except in its being more distant, of equal importance to our object, with Yunan. It has a population of some 30 millions, and contains some dozen cities of the first order. It produces *silk* of better quality and more abundantly, I was informed by the Chinese of Bammó, than any other province. Its tea is also superior and abundant. It furnishes rhubarb, musk and several other drugs, and many of the minerals found in Yunan.

QUEICHO is also a province in the neighbourhood of Yunan, and the great artery of trade Yangtsekiang runs up from Yunan, between it and Sechuen. Its products and its market also are well within the reach of British trade viâ Burmah, if the proper route be adopted.

QUANGSI is, I believe, much infested with wild tribes, but the banks of the Tsiking or Pearl River are dotted with Chinese towns connected by roads with the city of Yunan.

The former trade between Yunan and Burmah consisted almost solely of an exchange of the silk, copper, gold, orpiment, quicksilver, hams, honey, drugs, carpets and paper of Western China, for the raw cotton, ivory, amber, jadestone, peacocks' feathers, birds' nests, &c. of Burmah. Little tea was brought over beyond what the Chinese in Burmah consumed and scarcely any of the foreign articles imported into Burmah were taken to China.

The following information regarding some of the products of Western China was given me by the Chinese merchants at Bammó:

Silk.—Two kinds are recognised, *Koezo* from a district of that name, and *Sechuen* from the province so called. Price of *Sechuen* silk, 20 and 25 tickals the bundle of 165 tick; occasionally, however, it rises to 40 tickals. *Koezo* silk from 15 to 30 tickals the bundle. These are prices estimated from the old trade. Not an ounce of silk is sold at present at Bammó. The price of *Sechuen* at the capital is now from 30 to 35 tickals the bundle.

Very little silk is produced in Yunan. Nine bales make a bundle. They are packed first in paper, then oiled paper, then cotton cloth, and finally in case of transport to Burmah, in baskets lined with bamboo leaves, (the same as Kamsuks are made of,) and coarse carpets are thrown over the load of each pack animal.

The Chinese gave me the idea, that the road once open, this article can be supplied in unlimited quantity.

Tea.—The only kinds apparently known in the market at Bammó are the flat discs of China tea and the balls of Shan tea.

The discs weigh 20 tickals each; seven piled together make a packet which used to sell at $1\frac{1}{2}$ tickal and 2 tick. At present no tea is found at Bammó, except the Shan balls.

Western Yunan seems to produce little of this article. To the north and south, however, I was informed it is grown in abundance. *Poour*, a city of Yunan, about fifteen days south-east of Tali, produces excellent tea, and some Chinese informed me that from that district came the tea specially devoted to the Emperor's use. Others, however, contended that Sechuen, not Yunan, produced this celebrated tea. All agreed that Sechuen produces good tea and more abundantly than Yunan.

Copper.—In solid ingots or discs, and in the form of pots. The latter is the best, and used to sell at from 180 to 250 tick the 100 viss. The discs used to sell at from 100 to 180 tick. This is abundantly produced in Yunan.

Gold.—In leaf and in small ingots. Always touched when dealt in. The leaf, more easily and exactly estimated, averages 19 tickals of silver, the tickal of pure gold. It varies, however, to from 10 to 20 tickals. The ingots are less in value, owing to the less amount of certainty in the estimation of their quality, and are generally sold at 8 annas less than the leaf per tickal of estimated pure gold.

Opium.—Packets in paper, one viss each, averaged 20, 25 and 30 tick the viss, but varying from 10 to 50 tick on unusual occasions. The present price is 20 tick when bought by the traders of Bammó from the Kakhyens and Shans, who are now the only importers. The packets are some of them well packed and labelled, and are the produce of China; while the rest are carelessly packed, sometimes adulterated and are the produce of Shans and Kakhyens.

Musk.—This is mostly purchased by the Chinese from the mountain wild tribes. Its present price is 20—25 tick, the tickal, bought in the natural bag. It comes from Mogoung, Khamti and the Shan States as well as from the mountains in China Proper.

Silver.—I was informed is obtained from several mines. Perhaps the same motives led to the localities being not spoken of as to the Chinese telling me that the gold mines were exhausted.

Coal.—Several accounts agreed in affirming that there is abundance of this mineral at Momien and at Tali.

Salt.—There is no salt produced in Yunan as far as I could ascertain.

Sundries.—Straw hats, felt rugs, strike-lights, paper, white and coloured, rhubarb and other drugs, hams, honey, pipes, jackets and pants used also to be imported for sale to Burmans and Shans, and exportation down the river. Formerly at Bammó they used broadcloths and other woollen and cotton stuffs imported from Yunan. Now every thing comes from below, and British stuffs, were pointed out to me as "having come round by sea from Canton instead of as formerly, overland."

The raw cotton formerly exported to Yunan from Burmah exceeded a million of pounds a year. It is used not only for weaving but also for padding the winter garments.

Both this foreign and the internal trade of Yunan are now in abeyance, and for the time, extinct, owing to the disturbed state of that province, and the opposition of the Kakhyen tribes to Chinese traders. The capabilities of the country, however, remain the same. The articles of British manufacture that I could ascertain to be likely to find a market in Yunan, are broadcloths, lastings, blanketings and flannels, manufactured figured and damask silks, calicoes, long-cloth, muslins, jaconets, drills and plain *dark blue* or *black* cotton cloth, for which there is unlimited demand. *Broad-cloth* is universally used by

the Yunan Chinese who can afford to buy it. Blue and black are the favourite colours. Some fine broad-cloth I had purchased at Rangoon at 7½ Rs. the yard, would, at no time, fetch that price in Yunan, I was told. The home-made cloth was described to me as very thick, and used to sell at from 3 to 6 tickals the cubit in Yunan. That which came from Canton overland and from the interior, (Russian ?) they describe as thinner, like the cloth I had bought at 15 shillings a yard at Rangoon, and worth 1·8 or 2 tickals a cubit. There is however no doubt, I imagine, that cloth can be brought from England to Momien, viâ the Irrawaddy, at a cheaper rate than viâ Canton. Cotton twist and sewing thread, cutlery, buttons, mechanics' tools, locks and sewing needles, were also mentioned to me as things wanted for sale in Yunan.

The prices of all these articles have hitherto depended on those of Rangoon or Mandelay. It appears that British goods have never been, to any extent, imported into Yunan, viâ Bammó.

In explanation of the above prices, I should mention that a tickal weight is the 28th of an English pound, and a tickal of silver worth just 1¼ Rupee or half a crown. A viss is 100 tickals or exactly lbs. 3.652.

IV.—Conclusion.

From the statements brought forward under the preceding heads, and especially those under para. 2nd or that of the Physical Geography of the country to be traversed by the proposed line—and not omitting from consideration the new political position of Upper Burmah in reference to us, as well as the direction which any future political changes would certainly take—what then is the best route for European enterprise to avail itself of, in its endeavour to create a China trade through Burmah ?

Granting that the object to be sought is the most feasible way of reaching commercially the products and the markets of western China, especially Yunan, Seehuen and Queicho, it should first be ascertained what conditions should determine the plan to be adopted, in order to obtain that object.

Besides the obvious ones of the least political difficulties and the greatest commercial advantages, are there not others that have not perhaps hitherto been sufficiently thought of? viz. 1*st*. The holding in

our own hands and having under our control the greatest possible length, at this end, of the line of communication ; 2*nd*. That the plan be capable of being tested without a previous great expenditure ; 3*rd*. That when permanently established, as little as possible of the capital embarked in the means of transit be irretrievably sunk ; 4*th*. That the general route adopted be one already known and made use of by native traders ; 5*th*. That it also be one that—failing the possibility of constructing either a tram or a railway, either at once or even ultimately —may yet be worked with no great hindrance by the construction of a cart-road ; 6*th*. That the changes of mode of transit be as few as possible ; and 7*th*. That in short the greatest safety, cheapness and rapidity of carriage be combined with the least sinking of capital in the fixed plant intended to form the means of transit.

3. If such are the desired conditions, is it not obvious that, provided the Irrawaddy be navigable, and it be feasible to make a road from its highest easterly turn to Yunan, the best means to the object sought, is steam communication between Rangoon and some point near Bammó, and a land road thence to Yunan ? That the Irrawaddy is navigable for steamers just up to the desired point and no farther, I reported, a year ago. That the road across the 30 or 40 miles of Kakhyen hills to the plains of Yunan, can be constructed and ultimately replaced by a tram or railway, I have also recorded my firm conviction. Granted these two provisions, this route, then, sanctioned by ages of use between Burmah and China, shown above to be politically and physically that most feasible to follow, and commercially that most likely to give the highest returns for the least expenditure, is surely worthy of more attention than has hitherto been paid to it. Indeed the reasons for preference are so obvious and so old, that there is no room for a "discoverer," and I long deemed them too evident to need an advocate. It is true that, as long as the Upper Salween remains a river, whose navigability is only "not proven," we are none of us in a position to speak with absolute certainty. In regard to the Lower Salween, and the overland routes to Esmok, we have seen that material obstacles oppose themselves most strongly to their adoption. That, in the advocacy of which Capt. Sprye has so usefully and successfully roused the mercantile community at home, has the disadvantage of passing through hundreds of miles of unsettled country, peopled in many parts by wild and savage tribes, of traversing

several successive mountain ranges, and the valleys of three considerable rivers, the Sittang, the Salween and the Cambodia. But even if the "Emporium" of Esmok be neither a myth nor a hyperbole, that is surely not the point where it is most desirable to tap Western China. It is too far South for the districts we want, and for the desired easy access to the western end of the Yangtsekiang; while Quangsi is certainly not worth the trouble of reaching it by such a route, even if it were practicable. For my own part, I am indeed convinced that my anticipations, as recorded at the time of my first visit to Upper Burmah, will be ultimately realized, viz. that the ancient trade between Yunan and Burmah, viâ Bammó, would be revived and increased to a vast exchange between the manufactures of England and the products of China.

4. Intimately connected with this subject of trade route, is that of the overland telegraph communication between India and British Burmah, and the open ports of Eastern China. In reference to that subject and to the possible railway, I quote from a letter, written soon after my return from Bammó last year.

1. "As to a telegraph from Shangai to Yunan city, a line may and will pass, along the great artery Yangtsekiang.

2. "From Canton to Yunan, the Tsikyang may contend for the line to follow its course in preference to the above. There will probably be both.

3. "From Yunan city there is the regular trade route and high road through Tali and Yunchan to Momien, and thence through Sanda, Mowun or Maingmó to Bamó, or a point just below it. Between either Sanda, Mowun or Maingmó and the valley of the Irrawaddy, is about 30 miles of mountainous country inhabited by Kakhyens. At first these people would not perhaps respect the wire, especially in case of any individual being in want, at any moment, of metal for his bullets, arrows, or spears; but for ages they have been accustomed to give safe escort to dawk runners, and, to begin with, this two days' march may be got over in that way. Trifling subsidies would, however, soon reconcile the tribes and ensure the continuity of the wire.

4. "From the foot of the Kakhyen mountains to Bammó and on through Shoaygoo and Katha to Munipoor, across the country of quiet trading Kadees, there is no obstacle either geographical or in the way of wild tribes. From Munipoore to Calcutta, although in our own

territory and dependencies, would perhaps be the most difficult part of the line. Part of it, however, is already completed by the Assam lines.

5. "Such a line would be almost entirely between Lat. 23° and 25°, and in the case of the Tsikyang being followed from Canton to Yunan, would very nearly describe an arc of a great circle passing through Calcutta and Canton.

6. "From Katha a line would, of course, branch off and connect Rangoon viâ Mandelay and the present Pegu line with Bammó. Indeed this portion from Bammó to Thayetmyo or Prome will be, probably, the first constructed.

7. "A telegraph may go where a railway cannot; but the same reasons that forbid me to think of any other route than the above for the former, force me to believe that if Western China is to be tapped at all from the West or South, it will be by the same route. And if a railway or tramway be required, it will be from the neighbourhood of Bammó to Yunan city. The possibility of such a railway is for the present, I admit, as chimerical as that of one through any other unsurveyed region. By this route, however, the unknown occupies less of the distance than by any other.

8. "*The railway, however, is not necessary to even a vast commerce by the Bammó route.* River steamers and flats can navigate the Irrawaddy up to Bammó. There is the alternative of the Taping river or a perfectly flat road from Bammó to the foot of the Kakhyen hills. Up to this point, the route is through our own and the friendly Burman territory, the latter open to us by right of treaty.

9. "Three or four days mountain route, frequented from time immemorial by thousands of ponies, mules and asses that have carried westward, silk, tea, copper, gold, &c., and eastward, cotton, salt, serpentine, &c., reach Sanda or some other Shan frontier city, whence again the route is taken up by the civilization of China, and carried north-east, east and south-east.

10. "Bammó will be a mart again in a short time, as soon, in fact, as Yunan is quiet enough to make any trade possible; and seeking for any new mart in the unknown regions of Esmok, seems like looking for a new port to get at the cotton of the Confederate States, somewhere in Chili, because Charleston happens to be for the present, blockaded.

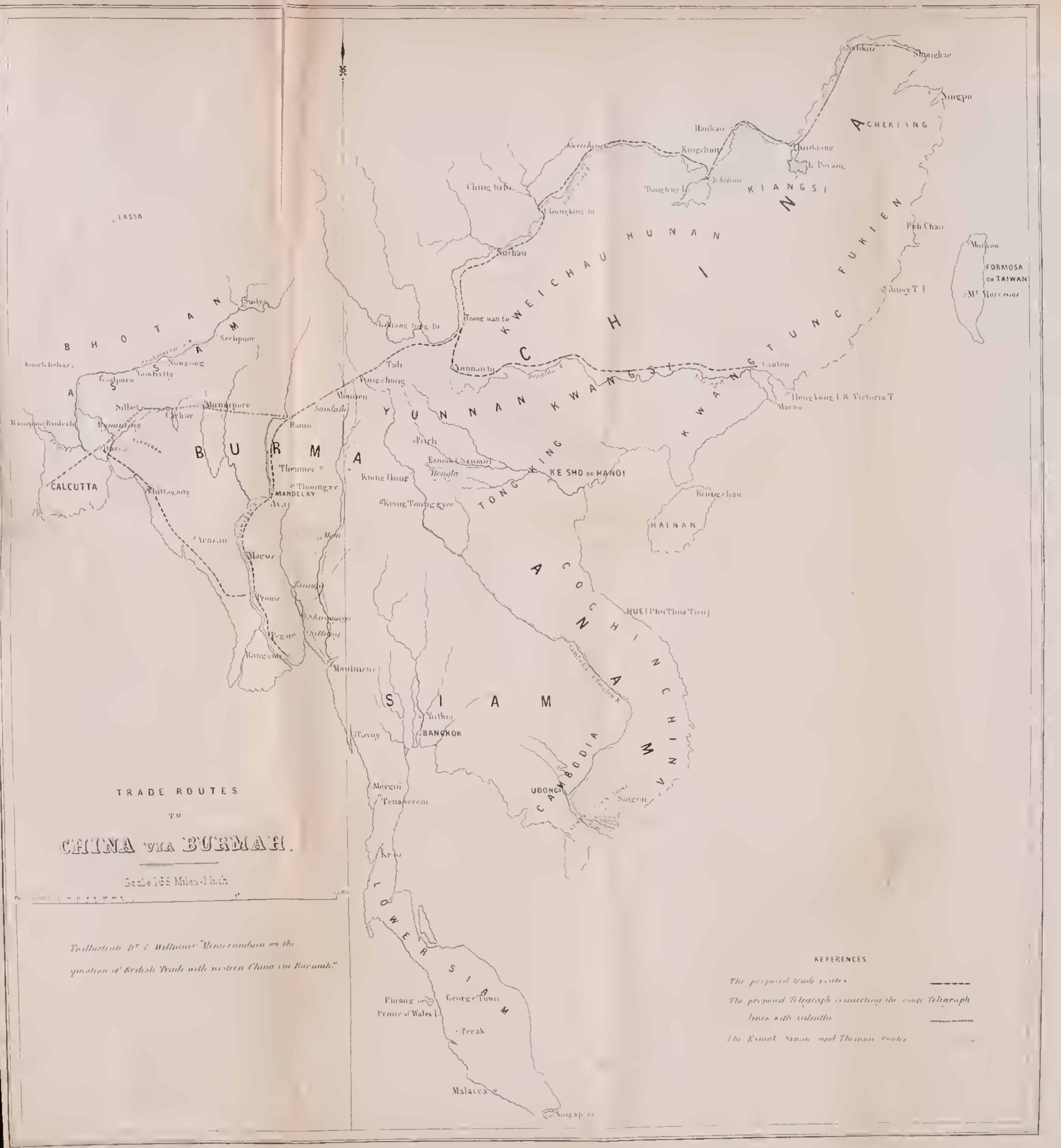
The modification of this route which, I believe will be found advisable is, as mentioned under the 2nd heading, to stop the steam

traffic at a point below Bammó, say *Sawuddy* or even *Koungtoung*, and to make a tram or railroad along the plain to near Masseen (vide. Map, No. 2). The passage of the 30 miles of Kakhyen hills to be made by a good road that may be, by and by replaced by a tram or railway. The telegraph to follow the same line, and both road and telegraph to enter China by the Shoaylee valley at Moungsun, and pass on by Maingmó, Seefan and Minglon to *Yunchan*, instead of passing from Bammó by way of Sanda and Momien to the same city.

11. "Referring to both trade and telegraph route, if any line is possible, it appears to me that this line is the most so. If any line will pay, it must be this, and if any line can be safe it must be this. Such a line will be, I firmly believe, that ultimately adopted, since it will be the shortest, the easiest, the cheapest, and the safest, and it follows the most frequented and oldest trade routes through the most populous and civilized territories between the Indian and Chinese seas."

Whichever be the route followed, however, and it may be that thorough surveys will entirely change the data on which present opinions are founded,—the day is evidently not far distant when Burmah will become the highway for a vast trade with China. Although Yunan is, for the time, so disturbed, I see no reason to fear that the domestic and foreign trade of that province will long remain in its present unsatisfactory state of abeyance. The Pansee revolution may indeed be found to have been useful in breaking up the power of exclusion of the Chinese authorities, backed as this would have been by all the influence of the Chinese merchants, whose jealousy blinds them to their true interests, and especially of the old Burmah company;—the chief of whom is said by the Right Rev. Bishop Chauveau to have 30,000 men at his orders. And while the province is in course of resuming such a settled condition as will make extensive commerce possible, whether it be under the old Chinese or the new Pansee authority, the surveys may be made, the routes and plans of action definitely arranged, and perhaps the communication opened just in time to meet the reviving trade.

The Taping rebellion by impeding as it must do, the commerce between the western province of *Yunan*, *Sechuen* and *Quicho*, and the eastern seaboard, encourages the attempt to pierce those provinces from the west. They form a splendid field, most inviting to the


TRADE ROUTES
TO
CHINA via BURMAH.
Scale 165 Miles=1 Inch
BHOTAN
ASSAM
BURMA
CHINA
YUNNAN
KWEICHAU
HUNAN
KIANGSI
CHEKIANG
FUKIEN
KWANGTUNG
KWANGSI
TONGKING
ANAM
COCHIN CHINA
SIAM
LOWER SIAM
CAMBODIA
HAINAN
FORMOSA OR TAIWAN
LASSA
CALCUTTA
MANDELAY
BANGKOK
UDONG
KE SHO OR HANOI
Shanghae
Ningpo
Hankau
Canton
Macao
Foh Chau
Tali
Bamo
Prome
Singapore
Malacca
Perak
George Town
Mergui
Tenasserim
REFERENCES
The proposed trade routes
The proposed Telegraph connecting the route Telegraph lines with Calcutta

Mountainous Country inhabited by Wild Tribes

MAP No. *

1. Of the country shewn in this Map viz the Kakhyeen Mountain and the plains on their Eastern and Western sides, only the portion in the neighbourhood of the Irrawaddy has been actually inspected
2. The remainder is constructed from data obtained by questioning a large number of well informed persons who had actually been the routes laid down, these data being subsequently collated and combined into a consistent plan.
3. That these various accounts should admit of being made into a consistent map, is in itself a good guarantee of their general accuracy.
4. Want of space prevented the insertion of several villages near Bamo and along the Taping Creek, these however are of no importance.
5. The principal routes are indicated by double or single lines, the figures between the places referring to the distances in Burman Deing (equal to two miles) Where the accounts did not agree I have marked two or more figures indicating the discrepancy.
6. The Races of the Inhabitants of the various villages & towns are shewn by letters following the name of the place, (B.) for Burman, (ch.) for chinese, (s.) for Shan and (k.) for Kakhyeen. The tribe of Kakhyeen is shewn where ascertained.

MOUNTAINS

KAKHYEEN MOUNTAINS

LIMESTONE MOUNTAINS

PLAIN

IRRAWADDY RIVER

TSHENBO

BAMO

SAMUDOY

SANDA

MAINGMO

MOMIEN (ch)

YUNCHIAN

MOWUN (ch)

NALUKAN HILLS

TRADE ROUTES

BETWEEN

BURMAH AND WESTERN CHINA

To illustrate Dr. C. Williams "Memorandum on the question of British Trade with Western China via Burmah"

Scale 2 Inch = 1 Mile
1 Inch = 1 Degree
Figures read as Deing

T. Ingrid, Colonel Williams.
Agent to Chief Commissioner
British Burmah.

spirit of enterprise that of old has characterised our commerce. There are forty millions of people waiting to be clothed with British piece-goods, and to be furnished with the handiworks of all the manufactories of England, and ready to give, in return, silk, tea, and the most valuable of the useful and precious metals, from mines that European skill would make many-fold more productive than now.

The barriers imposed by man are removed. There remain but those of nature. To the conquest of these, our science and capital, energy and perseverance will march again as they have so often marched before, and again will overcome them; to British commerce will accrue a new nation of buyers of our goods and sellers to our wants; to the cause of progress, a new opening for the living civilization of Europe to compete with the sickly semi-barbarism of Asia; to the cause of religion and humanity, a new field for Christian truth and beneficence to modify, alleviate and displace the cruelties of a fierce fanaticism and the vices of a degraded infidelity.

With the opening of this new way to China will be written a fresh page in our already glorious commercial history; will be taken another step in our onward destiny, and will be given yet another proof that Providence sanctions the mission we attribute to our race.

Mandelay, April 25th, 1864.

Table of the Coins of former Governments more or less current in the Bazars of the Goojrat District in 1859.

Communicated by the Punjab Auxiliary Committee of the Asiatic Society.
[*Received 16th February,* 1864.]

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
1	Ghuznee.	None.	Unknown.	8 Mashas.	These coins are scarce, they pass for 11 annas and 3 pies. Their date of coinage is not exactly ascertainable.
2	Alla-uldeen Mahomed Shahi.	Ulsooltan-ool-Azim Alawoodoonia woodeen. Abdool Mozuffer Mahomed Shah al Sooltan. Secunder sani zaheerool Khilafa nasiramiroola nowneen.	883 Hijree.	11¼ Mashas.	The silver of this coin is very pure. The coin is rare, and is much prized, being supposed to carry good luck with it. It is worth R. 1-4 and is often sold for as much as Rs. 2.
3	Feroze Shahi.	Ul Khuleef-amir-ool momneen Khuludulla moolkhoo. Futtyab Feroze Shah muddullah.		9 Mashas.	This coin passes for 12 annas. Only a few are current.
4	Feroze Shahi.	Ul Khuleef-amir-ool momneen Khuludulla moolkhoo. Feroze Shah Sooltanee zurbut fee Khilla Dehlee.		9 Mashas.	As No. 3.
5	Akbari.	Lailaha ililah Mahomed oor-russool illah. Jelaloodeen Padshah Ghazee.	993 Hijree.	11 Mashas, 3 rattees.	The silver of this coin is very pure. It sells for Rs. 1-4 in the Bazar.

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
6	Akbari.	As on No. 5. Jelaloodeen Mahomed Akbar Padshah Ghazee zarb oordoo zuffer pykur.	993 Hijree.	11¼ Mashas.	This coin is frequently met with. It sells for Rs. 1-4 to 1-8.
7	Mahomed Shahi.	Sikka Mahomed Shah Padshah Ghazee. Juloos mymnnt maloos moostukurrool Khilafé zurb Akbarabad.	1015 Hijree.	11¼ Mashas.	This coin is very common. Its price is generally about R. 1-0-6.
8	Alumgiri.	Sikka znddur Jehan Cho budur mooneer Shah Aurungzebe Alumgeer. Juloos mymnnt maloos zurb.	1118 Hijree.	11 Mashas, 2 rutteés.	As No. 7.
9	Mahomed Shahi.	Mahomed Shah Padshah Ghazi Saheb Qiran sani. Jaloos mymnnt maloos zurb dar-ool khilafah Shahjehanabad.	1161 Hijree.	11¼ Mashas.	As No. 7.
10	Cashmiri do suma.	Sikka buzur znd zimahee ta bamah Khooscrvé gaitee. Sitan Mahomed Shah zurb Cashmir sundo.	1162 Hijree.	11 Mashas.	This is an impure coin. It only sells for 5½ annas.
11	Ahmed Shahi.	Sikka mobaruk Ahmed Shah Padshah Bahadur Ghazee. Jaloos mymnnt maloos zurb sahrind.	1204 Hijree.	11¼ Mashas.	As No. 7.

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
12	Ahmed Shahi.	As on No. 11. Jaloos mymnut maloos zurb Etawah.	1204 Hijree.	11¼ Mashas.	As No. 7.
13	Gobind Shahi.	Deg-tegh Futty unsrut be dring-yaft az Nanuk Gooroo. Gobind Sing.	1836 Sumbut.	11¼ Mashas.	Common. Sells for 14 & 14½ annas.
14	Kandar Cashmiri.	Kuraryaft ba hookum i Khoda hurdo jehan rewaj Sikka dowlut ba nam Shah zuman. Jaloos mymnut maloos zurb Cashmir.	1204 Hijree.	11¼ Mashas.	Common but full of alloy & sells only for 11 annas.
15	Nanuk Shahi Poorana.	As on No. 13. Jaloos mymnut maloos zurb Akal.	1861 Sumbut.	11 Mashas, 1 ruttee.	This coin sells for 14 annas and 9 pies. It is often met with.
16	Wuzeerabadi.	As on No. 13. Jaloos mymnut maloos sree Umritsur.	1859 Sumbut.	11 Mashas.	This sells for only 12 annas being full of alloy.
17	Kulladar Jerlu kul.	Sikka zud bur huft Kishwar Sahé Fuzl illah hamideen-i-Mahomed Shah Alum Bad Shah. Jaloos mymnut maloos zurb Furookhabad.	1221 Hijree.	11¼ Mashas.	Sells at par. Only a few are obtainable.

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
18	Kulladar Seedhe kul.	As on No. 17.	1222 Hijree.	11¼ Mashas.	Sells at a discount of 6 pies.
19	Chulledar.	As on No. 17.	1222 Hijree.	11 Mashas.	Sells at a discount of 3 pies.
20	Pooklita Cashmiri ek sunna.	Sikka shood roshun zi shahe Noordeen raij az mukhdoom Qootub Arfeen. Zurb khilla, Cashmir sun-i-ahed.	1223 Hijree.	11 Mashas.	Very impure, worth only 6¼ annas.
21	Cashmiri nowa.	Zud ba taeed girdgar Azeem Shah Ayoob Sikka brer zur seem. Jaloos mymnut maloos zurb Cashmir.	1224 Hijree.	11 Mashas.	Very common, worth 10 annas.
22	Tisunna Cashmiri.	Sikka bur zurzud ba towfeeq-i-illah khoosrowe gaitee sitan Mahomed Shah. Zurb khilla Cashmir sun teen.	1224 Hijree.	11 Mashas.	As No. 21.
23	Jelalpooria Golab Singhia.	As on No. 13. Zurb Jaloos mymnut maloos sree.	1865 Sumbut.	10 Mashas, 5 ruttees.	Value 8 annas.

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
24	Cashmiri.	Sikka zuddur Jehan ba fuzl illah gusht raij ba nam Qaisar Shah. Zurb khilla Cashmir.	1225 Hijree.	11 Mashas.	Value 10 annas, uncommon.
25	Kunjur Shahi.	As on No. 13. Zurb mymnut sree.	1866 Sumbut.	$10\frac{3}{4}$ Mashas.	Worth 9 annas, very common; the usual medium of presents at marriages.
26	Goonda Mahomed Shahi.	Gaitee sitan, Mahomed Shah. Durool Sultanut (imperfect).	1229 Hijree.	$11\frac{1}{4}$ Mashas.	Worth 12 annas, common.
27	Moli Ramia.	As on No. 13. Zurb Khilla, Cashmir.	1877 Sumbut.	11 Mashas.	Value 9 annas; rather scarce.
28	Lahori.	As on No. 13. Zurb sree akal.	1877 Sumbut.	$11\frac{1}{4}$ Mashas.	Common and pure. It sells at par.
29	Lukhnow.	Sikka zud bur seemozur az fazl Rubb-i-zool Enunun Ghazeeoodeen Hydoné alee nusab Shahé zumun. Jaloos mymnut maloos zurb dar ool Sultanut Sooba Owud.	1842 Hijree.	$11\frac{1}{4}$ Mashas.	Latoly become common, imported from Hindustan in considerable numbers. Solls at par.

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
30	Saheb Singhia.	As on No. 13. Mynut zurb sree.	1882	11 Mashas.	Value 14½ annas, not common.
31	Chitta Nanuk Shahi.	As on No. 13. Zurb sree Akal.	1882	11¼ Mashas.	
32	Lahori.	Sikka zud bur hurdo Alum Shah Nanuk Wahib ust. Futty tegh Gooroo Gobind Singh fazl sucha Saheb ust.	1879 Sumbut.	11¼ Mashas.	At par value.
33	Shere Singhia.	As on No. 13. Zurb sree Akal.	1879 Sumbut.	8¼ Mashas.	Value 11½ annas.
34	Rulia Rami Pind Dadun Khani.	Tegh Gooroo Gobind fazl. Zurb Akal.	1879 Sumbut.	11¼ Mashas.	Par value.
35	Kirpa Rami.	As on No. 13. Zurb mymnut Cashmir.	1876	11 Mashas.	An impure coin, worth only 11 annas.

Figure.	Name.	Inscription.	Year of Coinage.	Weight.	
36	Tomanchi wala.	Saheb Qiran. Jaloos Mymnut maloos.		11 Mashas.	An old coinage of very pure silver: date unknown, scarce; worth 16 annas.
37	Rajah Shahee.	Sheonathjee Sehoy. Zurb sree.	1194 Hijree.		A 4-anna piece.
38	Hurree Singhee.	Sheonathjee Sehoy. Zurb sree.			Ditto.
39	Bahawul pooria.	Sikka Moobaruk. Mymnut sun jaloos zurb.	1261 Hijree.	8 Mashas.	Common, valuo 11 annas.

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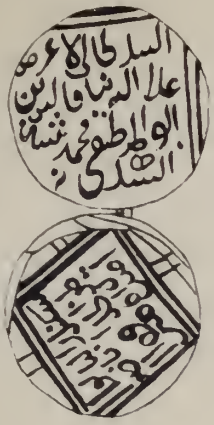

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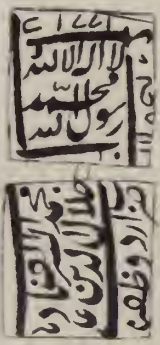

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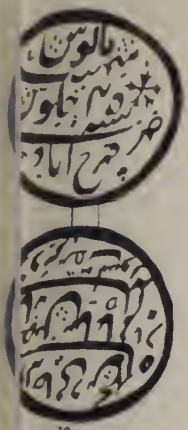
TRANSFER PAPER BY ABDOOL BAHEE & LITHOG: BY H M SMITH, SURVEYOR GENERAL'S OFFICE. CALCUTTA. OCTOBER 1864.

PLATE II.

...sfer paper by M Rahman ... by J. M. Smith Survr. Genl's Office, Calcutta, Oct. 1864.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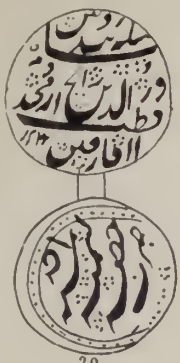
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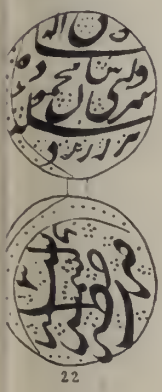
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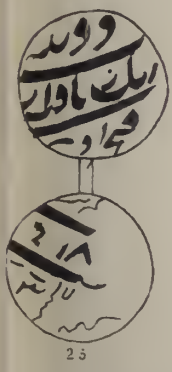
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TISSER PAPER B. HAFEEZUDDEEN AHMUD AND LITH. BY H.W. SMITH AT THE SURVEYOR GENERAL'S OFFICE CALCUTTA OCT. 1844


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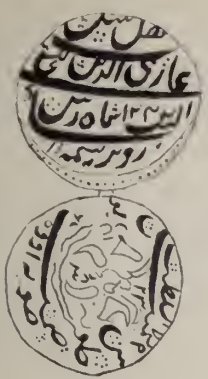
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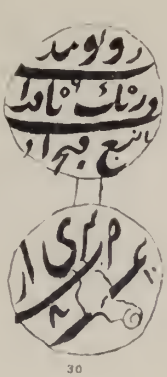
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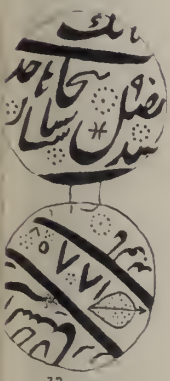
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SPER PAPER BY ABDOOL FUTTAH AND LITH' BY H M. SMITH SURVY GENLS OFFICE CALCUTTA OCT' 1864

Literary Intelligence.

The following is an extract from a letter lately received from General A. Cunningham.

In following up the history of the different races of the Punjab, I have extended the enquiry to the Chinese accounts of the Yue-chi, White Huns and Turks, and I believe that I have succeeded in identifying two of the Khakans of the White Huns and one Khakan of the Turks with some of those who are mentioned in western history. The want of success which had hitherto attended all attempts of this kind has led some ethnologists to doubt the value of the Chinese accounts of the Tartar nations but the identifications which I have already made will tend to remove this reproach. Thus Διζαβουλος the χαγαν of the Τουρκοι, who received the embassy of the emperor Justin is beyond all doubt the same as the great Khakan *Sha-po-lio* of the Turks, whose rule extended to the Caspian. The dates correspond; and so also do the names, for I take *Diza* to represent *Sha* of the Chinese—for which the more correct representative would have been *Dza*. But just as the *ch* = *ts*, of *Chatur* became τεσσ, so the *J* or *Z* = *dz* became Διζ. The name in fact is the same as *Zamol* in *Zamolxis*, and *Zabul* in *Zabulistan*, both of them being only the Scythian appellation of Hercules.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR JULY, 1864.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 6th Instant.

Captain W. N. Lees, Vice-President, in the chair.

The Proceedings of the last meeting were read and confirmed.

Mr. Oldham said—

"At the last meeting of the Society (June 1st) the attention of the members was directed to a very interesting specimen of a fossil reptilian, which had been received by the Society from Nagpore: and the Secretary (Mr. Blanford) made some valuable remarks bearing on the natural history, and geological age of this fossil. Mr. Blanford stated that the locality where it had been found was within the limits of the area coloured on the Geological Survey map of the Nerbudda valley prepared by Mr. J. G. Medlicott, as belonging to the "Mahadeva" group; and then entered into some speculations as to the possible age of this group, pointing out how essentially the fact of the occurrence of this reptile in the rocks of that group would affect the question of their geological age. As I believe that this fossil has nothing whatever to say to that group, I would desire to record the facts.

"It was stated to have been found about a mile west of Bijori village, at a spot where the stream is crossed by the cattle road from the Puchmuri plateau by Rori, &c. Now a mile west of Bijori, and where the hill path crosses the stream, is well within the limits of the Damuda works, on Mr. Medlicott's map, and as I have been at the spot, I can also say that it is so, in reality. Further the spot indicated on the map by Lieut. Sim, neither coincides with this description of the spot where the fossil was found, nor is it, at the base of

the Mahadeva hills as stated, but on the top. There is, evidently, therefore, nothing trustworthy in either of these statements, as bearing on the question of what group of rocks the fossil in question was derived from. Immediately on seeing the announcement of the discovery, I wrote to the Rev. S. Hislop of Nagpur, asking him to make very particular enquiries as to the locality, and stating my belief that it would be found not to be from the Mahadevas: and, with the permission of the Society, I will read an extract from his letter in reply, the last, I regret to say, of a long and valued correspondence I had with him. His intimate acquaintance with the rocks in his district, gives special value to his observations.

"Mr. Hislop writes—(under date 11th August, 1863) speaking of the fossil in question—'On the footpath leading to the Rori-ghat, Major Gowan met with a detached block of sandstone, bearing the impression of the ribs and vertebral column of an animal, which the natives around were in the habit of calling a fish, but which our countryman more properly considered a reptile. The matrix having been found out of position, it was difficult for the discoverer, or the European officer who was requested subsequently to tread in his footsteps, to ascertain to which sandstone strata it had belonged, whether to the great pile of arenaceous beds that constitute the mountain mass, or to the few that lie below. *This is no longer a matter of uncertainty.* I have had a good deal of experience in the various kinds of sandstone that occur in this province, and the sample from near Bijori I saw at once belonged, not to the Mahadeva formation but to the lower Damuda group. There was an absence of all tendency to ferruginous septa, so characteristic of the former, and an abundance of mica so uncommon in the former, but so frequent in the latter. In splitting some of the laminæ produced by the mica, I detected carbonaceous matter, such as is found between the layers of the Lower Damuda sandstone. *There can be no question then, that the slab is from the inferior strata of our Indian Coal formation.*'

"Mr. Hislop proceeds to describe the characters of the Reptile in question, and to note the particulars which he observed when clearing out the fossils from its matrix. But these are matters relating to its natural history, and my only object now is, to place on record the fact, that the specimen in question had almost certainly, nothing whatever to say to the 'Mahadeva' group.

"Mr. Blanford himself noticed the difference in mineral character of the rock in which this fossil was imbedded, as compared with the ordinary aspect of the Mahadeva rocks."

Mr. Blanford remarked that he too had inferred from the mineral character of the matrix that the fossil was not from the Mahadeva sandstones, but showed that the spot marked by Lieutenant Sim on Mr. Medlicott's map placed it in the Mahadevas, and at some distance from the boundary of the older rocks.

Presentations were received—

1. From the Under Secretary to the Government of India, Public Works Department, an impression in clay of a Sanscrit inscription found at the foot of one of the jambs of the inner gateway of the ruins at Baragaon.

2. From Colonel S. R. Tickell, two specimens of a fish in spirit, supposed to belong to the Cod family.

3. From J. R. Macdonald, Esq., a specimen of a mat used by the natives of Moulmein for thatching purposes.

4. From A. Grote, Esq., specimens of a *Hylobates lar*, and a Centipede.

5. From Dr. Squire, on the part of Mr. Dunn of Akyab, a collection of snakes in spirit.

6. From A. Carlyle, Esq., Officiating Curator, two specimens of a large species of Petrel, a few specimens of North American fresh water and semi-fossil shells, and a piece of Iron Ore from N. Wales, also a few small specimens of native Turquoise found *in situ* in Asia Minor.

7. From the same, a copy of Graves' *Ovarium Britannicum*, also two articles about the battle of Trafalgar and Lord Nelson, published in the *Gibraltar Star* a few days after that battle.

8. From the same, specimens of fishes and crustacea from the Salt Water Lake.

9. From Mr. C. Swaris, a pair of shoes used by the people o Bhotan.

Letters from J. P. Grant, Esq. C. S., and Baboo Ramgopal Ghos intimating their desire to withdraw from the Society, were recorded.

The following gentlemen, duly proposed at the last meeting, wer balloted for and elected ordinary members :—

Lieutenant H. Trotter, Bengal Engineers.

J. C. Whishaw, Esq., Civil Surgeon.

Baboo Debendra Mullick.

The following gentlemen were named for ballot as ordinary members at the next meeting:—

Dr. C. R. Francis, proposed by Mr. Grote, seconded by Mr. Blanford.

C. B. Garrett, Esq., C. S. proposed by Mr. Grote, seconded by Mr. Blanford.

W. Swinhoe, Esq., proposed by Mr. Obbard, seconded by Mr. Blanford.

Rev. J. Ebenezer Marks, proposed by Mr. McCrindle, seconded by Mr. Blanford.

The Secretary read the following letter from Mr. Oldham:—

Calcutta, June 21st, 1864.

To the President and Council of the Asiatic Society.

Gentlemen,—While feeling much honored by my re-election to the Council of the Asiatic Society, I regret that I cannot accept the duty without sacrificing a principle for which I have long and strenuously contended. I only ceased to urge the alteration in the rules of the Society which make a certain annual change in the constitution of the Council and officers compulsory, because some of my colleagues, approving the principle, and proposing to act on it, still thought it not desirable that this change should be obligatory.

Glad, therefore, to see this change introduced, as I believe it to be essential to the well-being of the Society, I could not without great inconsistency, again rejoin the Council at present. After the lapse of the proposed interval, I shall be happy to be of any service in my power.

I am, Gentlemen, &c.,

(Sd.) T. Oldham.

The report of the Council, appointing Mr. H. B. Medlicott, a member of their body, vice Colonel Dickens, was confirmed.

The Council reported that they had elected Messrs. J. Strachey and J. Geoghegan to the Council, in the place of Mr. H. Scott Smith, deceased, and of Mr. Oldham, who has declined to accept the nomination.

Communications were received—

1. From Colonel S. R. Tickell, description of a supposed new genus of the Gadidæ.

2. From the Secretary of the Punjab Auxiliary Committee to the Asiatic Society, papers containing a description of Coal in the Khuttak Hills.

3. From R. H. Barnes, Esq., Meteorological Abstract of Observations taken at Gangarowa, Ceylon, from September, 1863, to February, 1864.

4. From Dr. C. Williams, Memorandum on the question of British Trade with Western China viâ Burmah.

5. From Baboo Gopinath Sen, an Abstract of the results of the Hourly Meteorological Observations taken at the Surveyor General's Office in April.

6. From Captain W. N. Lees on the Romanizing of Oriental Alphabets.

Captain Lees then read his paper above mentioned;* and at the close of the reading a discussion ensued on the interesting question of which it treated, in which the Lord Bishop, Mr. Heeley, and the author took part.

The Bishop heartily agreed with Captain Lees that the Roman character should be used in reducing to writing the languages of the aboriginal tribes of India, and regretted very much that Dr. Judson and the American Missionaries had written the Karen language in Burmese characters. He also rejoiced in the willingness which Captain Lees had expressed to apply the Roman alphabet to Hindustani. But he desired to go further than this, and omitting the consideration of dead languages, as involving many peculiarities which it would be too long to discuss, he would gladly see that alphabet used for all the living languages of India. That a change of alphabet was practicable, he considered certain, for it had frequently occurred. The old Hebrew character, now commonly called the Samaritan, was abandoned at the time of the captivity, and for that alphabet (which had probably been regarded as sacred, certainly as venerable) the square Chaldee letters were substituted, in which we now read our Old Testament. The Mahomedans forced the Arabic letters, as a religious duty, on the nations which they conquered; and they are now used in writing languages as different as Arabic, Persian and Malay. Yet the Persians had a character which they must have regarded at least with reverence, and to which they had been accustomed for ages. In Europe

* See *ante*, p. 345.

there had been changes, scarcely less important, from the Celtic and Gothic alphabets to the German and Roman. Captain Lees had quoted the tenacity with which the Germans and Greeks cling to their own alphabets in support of his argument. But in the first place the difference between those alphabets and the Roman is trifling, and the trouble of decyphering them slight. In the second, in each case there had been a patriotic feeling recently at work in favour of the old alphabet: the wars of Napoleon had thoroughly disgusted the Germans with everything French, and therefore with the Roman Alphabet: and the newly emancipated Greeks were anxious to prove their descent from the contemporaries of Thucydides and Plato. Besides, in Germany, the Roman alphabet was making way. Ewald, for instance, had printed his history and commentaries in that character. Again, the Dravidian language in Southern India used alphabets derived from the Devanagri; though they had no affinity to Sanscrit, and therefore they might as well use the Roman. Hence, as the change appeared from historical examples to be practicable, it ought to be adopted, not merely from theological or economical, or any partial consideration, but from the general fact that the multitude, variety, and needless diversities of the Indian Alphabets, made it absolutely impossible to master all the Indian languages, and effectually separated from each other the natives of different parts of the peninsula. Captain Lees had scarcely stated with sufficient force the terrible medley of characters with which the country was afflicted. Dialects differing less than those of Yorkshire and Somersetshire, were written in different characters. The two great parent alphabets had branched out into at least twenty varieties. Orissa had a different form from Bengal: each of the three Dravidian tongues had its own alphabet. A change seemed essential to the civilization of India, and though to attempt to force one upon the people would be wrong, and must end in ludicrous failure, yet books in every living Indian language should be printed in Roman character, and left to make their own way.

Mr. W. L. Heeley maintained that alphabets, like constitutions, were developed by nature, and suited to the instincts of the several races which used them, and that it would be highly difficult, if not impossible, to impose a strange alphabet upon any race which had developed one by its own efforts. We have not yet obtained a scientific analysis of the circumstances under which alphabets had

been adopted; but he thought that the cases, which on a cursory view of the subject occurred to him, would support his belief. The Lord Bishop had referred to the change in the Hebrew alphabet made during the Babylonish captivity, but this was a mere change in the form of letters, like our English change from German text to the present Roman hand; no letters were added or omitted; and the change was not proved to be derived from any foreign, or non-Semitic, influence. Instances like the adoption of the Arabic alphabet by the Turks were cases where a totally illiterate people without an alphabet (for the Turanians of Central Asia do not seem to have developed one,) adopted that of the race most allied to them by politics and religion; and the case of the Magyars was a similar one. That, however, the natives of India took most kindly to the indigenous, or Nagri, alphabet, of which the various alphabets in use are modifications, might be proved in many ways, and among others by the non-success of the Mussulman rulers in introducing their own, or the Arabic, alphabet. Hindustani, though spoken almost all over India, was not the written language of any portion of India; only scholars and Court Amlah could write the Arabic character, and, for the purposes of common life, the native alphabet was preferred even when, as among many of the Bengali Mussulmans, the literature was composed in a *patois* which had more Arabic and Persian words than Sanscrit words. The attempt, therefore, to apply to Hindustan the English alphabet was not likely to succeed. Persons who would not learn the Arabic alphabet would naturally write in Nagri, or one of its derivations. He could not agree in the conclusion to which both Captain Lees and the Lord Bishop had arrived, that, in case of non-Arian languages of limited extent which had not a vocabulary of their own, the English alphabet might be used with advantage, and he instanced the Khonds, hill-tribes of Orissa, who were surrounded by, and mixed up with, an Ooriah population speaking an Arian language with an alphabet derived from the Sanscrit. A Mission had recently been established there, and the missionaries had very properly, in his opinion, printed their Khond books in the Ooriah alphabet. What was the object of introducing the English alphabet? Not that it was more perfect;—the Ooriah alphabet was a far more perfect and useful and better arranged one, and quite as easy to read. The object was to put them *en rapport* with civilization, to facilitate their

acquisition of English. But when are the Khonds likely to want English? Certainly not before the Ooriahs want it; and the knowledge of the Ooriah alphabets would be practically useful to them every day. They will seldom see Europeans. The very work of the mission, and of teaching, will be carried on mainly by Ooriah ministers and catechists; and the business of daily life, the buying and selling, is altogether conducted by Ooriahs. It is clear that in this case the advantages of the Ooriah alphabet outweighed those of the English, and it would probably be found the same, on the most superficial view, in other similar cases. Broadly, it appeared that the civilization of these scattered and insignificant tribes would be better attained by bringing them up to the level of civilization enjoyed by surrounding districts, than by attempting anything higher; what we wanted was not to Europeanize parts of India, but to weld the whole into a compact mass, to give it that homogeneity, the absence of which so much weakens all exertions either of the teacher or legislator for the benefit of the people. If a common alphabet could effect this to any extent, that alphabet must be the one which the *indoles* of the natives of the country had worked out for itself, and which could more easily be learnt than any other, besides being in itself true, perfect, and better than any alphabet we could give them. Mr. Heeley concluded by appealing to Captain Lees for corroboration of the views expressed by him with regard to the non-development of an indigenous alphabet among the Scythian races.

Captain Lees said he was glad the Bishop had favoured the meeting with an expression of his opinion on this question, in which it was known he took a deep interest. He had listened with great interest to his Lordship's remarks, and while he concurred in much that he had said, he thought that much in which he could not concur might be reconciled with the views enunciated in the paper just read. The object his Lordship and those who were of his opinion had in view was universality, and now he thought that sufficient consideration had not been given to the widely-spread area over which the Hindustani language was used, a range of country extending from Peshawur on the north to Cape Comorin on the south. If we applied the Roman alphabet to this one language, no doubt it would familiarize a very large portion of the people of India with these characters. But to do even that, would be a *magnum opus*. It would, moreover, at the

outset at least, be experimental; and it must be admitted that in all experimental undertakings, however good grounds we may have to hope for success, we must not be unprepared for failure. Now, if we were suddenly to print books in all the languages of India in the Roman characters, and introduce them into all our villages and vernacular schools, and the experiment were to fail—*i. e.* if the people generally were to refuse to adopt these characters—there can be no doubt that we should have succeeded in doing a very great mischief. In dealing with Hindustani alone, we tread on sure ground. We make the experiment with some prospect of success, while we reduce the risk of danger to a minimum. It must be recollected however, that the present movement is wholly an outside one. The natives of this country, for whose languages alphabets have been perfected, do not ask for any change. They do not want it. We find the number of these alphabets inconvenient, and we wish to change them all for our own; but we are aliens, and the question is, should such a point be decided by foreigners? In regard to the question asked by Mr. Heeley, I am not prepared at present to enter on a review of the progressive development of writing amongst the Scythians. The early history of the colonies of these races who entered India, is involved in much obscurity, from which it will probably never be unveiled. Their earliest records are to be found on the coins of Bactriana subsequent to the downfall of the Greek kingdom. They are written in two characters—corrupt Greek and Bactrian, merging later into the Indian and Sanscrit alphabet; and as both these alphabets were foreign, it would appear that the early Scythians had no alphabet of their own. The Thibetan alphabet is borrowed from the Indian, and is comparatively modern. The irruption of the Osmanli Turks into Europe did not take place until long after they had embraced Mahomedanism. That people had changed their alphabets, as well as their languages, there can, however, be no question. In fact, if we trace the history of the progressive development of alphabets, we find it to be one continued series of changes and it is to the variety of directions in which these changes and developments have been made, that we owe the multiplicity of alphabets we now possess, as I have explained in my paper. Nations with imperfect alphabets have never objected to change them. On the contrary, they have shown a tendency to elaborate, improve, and

perfect them, as their ideas and their languages became enlarged. In short, in the East, Mr. Heeley is quite correct in speaking of the indigenous *growth* of alphabets, for undoubtedly in India alphabets have grown with the languages they belong to, and to them they have a prescriptive right. I do not think then that it would be difficult to reconcile the extreme views of either of the speakers with the more moderate and mean position I have taken up.

The Librarian submitted a report of the accessions to the Library since the meeting held in February last.

Library.

The following additions have been made to the Library since the meeting held in February last.

Presentations.

*** *The names of donors in capitals.*

Les Animaux; extrait du Tuhfat Ikhwan us Safa.—M. Garcin de Tassy.

Cours d' Hindoustani for December 1863.—The Same.

Tables of Heights in Sind, the Punjab, N. W. Provinces and Central India determined by the G. T. Survey of India.—The Government of India.

Catalogue Raisonnée of Oriental MSS. in the Library of the (late) College of Fort Saint George, now in the charge of the Board of Examiners; by the Rev. W. Taylor, Vols. II. and III.—The Bengal Government.

Westwood's Oriental Entomology.—Lt. R. C. Beavan.

History of the Reigning Family of Lahore with some account of the Jummoo Rajahs—By Major G. C. Smyth.—The Author.

The Dáya Bhága.—Babu P. C. Tagore.

A Treatise on the chronology of Sinaitic monuments, by His Highness Hekekeyan Bey.—The Author.

History of Hyder Ali and Tippoo Sultan.—Prince Gholam Mahommed.

Brief History of Ancient and Modern India from the earliest period of antiquity to the termination of the late Mahratta war.—The Same.

Natuurkundig Tidschrift voor Nederlandsch Indie, Vol. XXVI.—The Society.

Illustrations of the Meteorology of India and High Asia, by H. de Schlagintweit.—The Bengal Government.

Ditto ditto.—The Inspector General of Hospitals.

Official Hand-book of the Punjab Exhibition.—The Punjab Government.

A Collection of Treaties, Engagements, Sunnuds, relating to India and the neighbouring countries, Vol. V., compiled by C. U. Aitchison, Esq.—The Government of India.

Indische Studien, Vol. VIII.—The Editor.

On the identification of the Acanthaceæ of the Linnean Herbarium, by T. Anderson, Esq., M. D.—The Author.

An enumeration of the species of Acanthaceæ from the Continent of Africa by T. Anderson, Esq., M. D.—The Same.

Le Trésor des chartes d' Arménie ou Cartulaire de la Chancellerie Royale des Roupéniens, Par Victor Langlois.—J. Aydall, Esq.

Memoires de l' Academie Impériale des Sciences de St. Petersbourg, Tome IV. Nos. 10 and 11.—The Academy.

Bulletin de l' Academie Impériale des Sciences de St. Petersbourg, Vol. IV. Nos. 7 to 9, and Vol. V. Nos. 1 and 2.—The Same.

Annales Musei Botanici Lugduno Batavi, edited by F. A. Guil. Miguel, Tome I. Fasc. 1, 2 and 3.—The Lugduno Batavian Academy.

Memoirs of the American Academy of Arts and Sciences, New Series, Vol. VIII. Parts 1 and 2.—The Academy.

Proceedings of the American Academy of Arts and Sciences, Vol. V. pages 241—457, &c., Vol. VI. pp. 1—96.—The Academy.

Proceedings of the Royal Geographical Society, Vol. VIII. Nos. 1, 2 and 3.—The Society.

Proceedings of the Natural History Society of Dublin, Vol. IV. Part 1.—The Society.

Report of the Proceedings of the Archæological Surveyor to the Government of India for 1862-63.—The Government of India.

Annual Report on the administration of the Coorg districts for 1862-63.—The Bengal Government.

Annual Report on the administration of Mysore for 1862-63.—The Same.

Report of a Meeting of the Bethune Society held in honor of Dr. Duff.—Baboo Ramchunder Mitter.

Transactions of the Entomological Society of New South Wales, Vol. I. Part 2.—The Society.

The Anthropological Review and Journal, Vol. I. Nos. 1 to 3, and Vol. II. No. 4.—The Anthropological Society.

Toungoo News Sheet, Vol. I. Nos. 1 to 3.—The Rev. F. Mason.

Professional papers on Indian Engineering, Vol. I. Nos. 1 and 2.—Major J. G. Medley.

Purána Sangraha, Parts 12 and 13.—Babu Kali Prosonno Singh.

Selections from the Records of the Government of India, P. W. Department, No. 40.—The Government of India.

Report on the result of the administration of the Salt Department for 1862-63.—The Bengal Government.

The Chinese and Japanese Repository of facts and events in Science, History and Arts, relating to Eastern Asia, Vol. I. Nos. 1 to 5.—Professor Summers.

Address delivered at the Anniversary Meeting of the Geological Society of London on the 19th February, 1864, by Professor Ramsay F. R. S.—The Author.

Report of the Committee of the Bengal Chamber of Commerce from 1st November, 1863, to 30th April, 1864.—The Chamber of Commerce.

Instructions for taking Meteorological Observations, with tables, by Sir H. James.—Col. H. L. Thuillier.

A Pali Grammar, by J. Alwis.—The Author.

Eight years in Asia and Africa from 1846 to 1855, by J. J. Benjamin, Esq.—The Author.

Byan Maka Za Oolum, compiled by Saiyed Keramut Ali.—The Compiler.

Die Gedichte des Urua ibn Alward, herausgegeben, ubersetzt und erläutert von T. Nöldeke.—The Editor.

Catalogue annuel de la Librairie Francaise, by C. Reinwald.—The Compiler.

Catechism of the Shaiva Religion, Parts 5 and 6.—The Rev. T. Foulkes.

The Kusumánjali or Hindu Proof of the Existence of the Supreme Being, with a translation.—E. B. Cowell, Esq., M. A.

Bleeck's Spiegel's Avesta, the religious books of the Parsees.—The Editor.

The tale of the battle of Padmanabham, with a Telugu translation.—A. L. Carlyle, Esq.

Ovarium Brittanicum—or an accurate delineation of 50 Figs. of British Bird's Eggs, by G. Graves, Esq.—The Same.

The Annals of Indian Administration, Vol. VIII. Part 1.—The Bengal Government.

Quarterly Journal of the Geological Society of London, Vol. XX. Part 1.—The Society.

Journal of the Statistical Society of London, Vol. XXVI. Part 4, and Vol. XXVII. Part 1, with an Index to Vols. XVI—XXV.—The Society.

Journal of the Agricultural and Horticultural Society of India, Vol. XIII. Part 2.—The Society.

Jahrbuch der K. K. Geol. Reichsanstalt, Vol. XIII. No. 3.—The Society.

Journal Asiatique, Sixieme Série, Vol. II. Nos. 4 to 7, and Vol. III. Nos. 8 and 9.—The Asiatic Society of Paris.

Proceedings of the Royal Society of London, Nos. 58 to 63.—The Society.

Rahasya Sandarbha, Vol. I. Nos. 10, 11, 12 and 13.—The Calcutta School Book Society.

Bijdragen tot de Taal-land en Volkenkunde Nederlandsch Indie, Vol. VI. Stuk 3.—The University of Leyden.

The Calcutta Christian Observer, Vol XXV. Nos. 290 to 294.—The Editor.

Journal of the Academy of Natural Sciences of Philadelphia, Vol. V. Part 4.—The Academy.

Proceedings of the Same Nos. 3 to 7 of 1863.—The Same.

Memoirs of the Geological Survey of India (Palæontologia Indica) Vol. III. Part 3.—The Government of India.

Another copy of the Same.—The Government of Bengal.

Another copy.—The Superintendent Geological Museum.

Memoirs of the Geological Survey of India, Vol. III. Part 2, and Vol. IV. Part 2.—The Same.

Proceedings of the Scientific Society of Ghazipur, Nos. 2 to 4 of 1864.—The Society.

The Oriental Christian Spectator, Vol. IV. Nos. 5 to 8.—The Editor.

The Oriental Baptist, Vol. XVII. Nos. 201, 202 and 203, Vol. XVIII. Nos. 205 to 209.—The Editor.

The Calcutta Review, Nos. 76 and 77.—The Editor.

Selections from the Records of the Bengal Government, No. 39, Part 2.—The Bengal Government.

Selections from the Records of the Madras Government, No. 76 for 1862-63, with a map.—The Government of Madras.

Returns showing the operations of the Income Tax Act in the N. W. Provinces for 1861-62.—The Government N. W. Provinces.

Proceedings of the Royal Institution of Great Britain, Vol. IV. Parts 1 and 2.—The Royal Institution.

List of the members and officers and Professors of the Royal Institution of Great Britain for 1863.—The Same.

Calcutta Christian Intelligencer, Vol. XXXIX. Parts 1 to 3, 4 and 6.—The Editor.

General Report on Public Instruction in the Lower Provinces of the Bengal Presidency with Appendices for 1862-63.—The Director of Public Instruction.

Selections from the Records of the Bombay Government, No. 79.—The Bombay Government.

Proceedings of the Zoological Society of London, Part 2 of 1863.—The Society.

Journal of the Royal Geographical Society of London, Vol. XXXII.—The Society.

Journal of the Royal Asiatic Society of Great Britain and Ireland Vol. XX. Parts 3 and 4.—The Society.

A list of the Fellows, annual Subscribers and Honorary and Corresponding members of the Zoological Society, London, for 1863.—The Society.

Journal of the Chemical Society of London, 2nd Series, Vol. I. Nos. for October, November and December, 1863, with a Supplement for Dec. and Vol. II. Nos. for January, February and March, 1864.—The Society.

Journal of Sacred Literature and Biblical Record, New Series, Vol. IV. No. 8 and Vol. V. No. 9.—The Editor.

Report of the Pulni Mountains, to accompany the Series of sketches by Lieutenant-Colonel D. Hamilton.—The Madras Govt.

Verhandlungen der Zoologisch-Botanischen Gesellschaft, Wien—Vol. XIII.—The Society.

Monographie der Oestriden von Friedrich Brauer.—The Zoologico-Botanic Society of Vienna.

Jahrbuch der Kaiserlich-Königlichen Geologischen Reichsanstalt, XIII. Band. No. 4.—The Imperial Mineral Cabinet of Vienna.

Indische Studien, herausgegeben von Dr. Albrecht Weber. 8*er* Band.—The Editor.

Zeitschrift der Deutschen Morgenländischen Gesellschaft, Band XVIII. Parts 1 and 2—The Society.

Mjölnir og Vadjra af C. A. Holmboe. *Pamphlet.*—The Author.

Om Ortug eller Tola, en skandinavisk og Indisk Vaegteenhed af Professor Holmboe—*Pamphlet.*—The Same.

Amuletter og om stormænds Begravelse af C. A. Holmboe—*Pamphlet.*—The Same.

Om Haugelys af C. A. Holmboe—*Pamphlet.*—The Same.

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Det Kongelige Norske Frederiks Universitets Aarsberetning for Aaret, 1861.—The Same.

Beretning om Bodsfængslets Virksomhed i Aaret, 1862.—The Same.

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Peter Andreas Munch ved Paul Botten Hansen.—The Same.

Taxidermi—*Pamphlet.*—The Same.

Aperçu des différentes méthodes de traitement employées á l'hôpital de l'Université de Christiania contre la Syphilis constitutionnelle, par J. L. Bidenkap.—The Same.

Committee—Beretning Angaaende Syphilisationen.—The Same.

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En storre Bibelhistorie. Det Nye Testament.—The Same.

Beretning om Sundhedstilstanden og Medicinalforholdene i Norge i Aaret, 1860—Afgiven af Departementet for det Indre—The Same.

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Purchases.

The Annals and Magazine of Natural History, Vol. XII. No. 72 and Vol. XIII. Nos. 73 to 77.

Comptes Rendus de L'Academie des Sciences, Nos. 17 to 26, Vol. LVII. and Nos. 1 to 17 of Vol. LVIII.

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Atlas Ichthyologique des Indes Orientales Neerlandaises, Livraisons 11, 12 and 13, by M. P. Bleeker.

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The Arabian Nights, translated by E. W. Lane ; 3 vols.

Standard Alphabet, by C. R. Lepsius.

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Hercule et Cacus, étude de Mythologie comparée, Par M. Breal.

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Amara Kosha, *Sanskrit MS.*

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The Rock-cut Temples of India. By J. Fergusson.

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Gould's Birds of Asia, Part 16.

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The Kamil of El-Mubarrad, Part I. By W. Wright.

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Memoires D'Histoire et de Géographie Orientales; (Memoire sur le Fotouho's—Scham) par M. J. De Goeje, No. 2.

Noms Indigènes d'un Choix de plantes du Japon et de la Chine, Par MM. J. Hoffman et H. Schultes.

The Grand study, (Ta Hio or Dai Gaku) Edited by Dr. J. Hoffman, Parts 1 and 2.

Gia-Dinh-Thung-Chi. Histoire et description de la Basse Cochinchine, Par G. Aubaret.

Memoire sur la partie Méridionale de L'Asie Centrale, par Nicolas de Khanikoff.

LÁL GOPÁL DUTT.

July 6th, 1864.

FOR AUGUST, 1864.

The adjourned Monthly General Meeting of the Asiatic Society of Bengal was held on the 11th instant.

CAPTAIN W. N. LEES, LL. D., Vice-President, in the Chair.

The Proceedings of the last meeting were read and confirmed.

Presentations were announced—

1. From the Secretary of the Benares Debating Club, a copy of the Rev. W. Hooper's Lecture on Letters, lately delivered before the Club.

2. From Baboo Jwalanauth Pundit, a collection of Persian and Urdu MSS.

3. From C. Horne, Esq., C. S., two skins of Paradoxurus.

4. From Lieutenant R. C. Beavan, a collection of Indian Lepidoptera (Papillionidæ and Tineæ) a collection of eggs of Indian birds; and two skins of the Paradise Fly-catcher.

5. From R. D. Stewart, Esq., two young bats in spirit.

6. From A. Grote, Esq., a Kangaroo.

7. From Lieutenant C. S. Pratt, of the 31st Punjaub N. I.,

several Cossyah swords and arrows captured during the late disturbances in those hills.

8. From Colonel C. S. Guthrie, specimens of a peculiar kind of Ivory called "Shermie," used in the Upper Provinces of India, in the manufacture of dagger handles, &c., &c., and said by those that deal in it, to be brought from Russia.

9. From A. C. L. Carlyle, Esq., Officiating Curator, specimens of Plumbago and Manganese Ore, obtained by him from Pedda Kada Kondah in the Zemindary of the Rajah of Vizianagaram, Northern Circars.

The Curator exhibited the following Zoological specimens.—A *Varanus* and two small bittern-like herons *viz.*, a variety of *Ardeola Malaccensis* and a specimen of *Ardeola cinnamonea* shot by him for the Society; a large *Monitor* shot near the Salt Lake Canal; specimens of certain snakes obtained by him, *viz.*, *Tropidonotus stolatus*, *Tropidonotus schistosus*, and *Tropidonotus umbratus;* a specimen of a species of fossil *Clypeaster* found by him in the desert near the Great Pyramid; and specimens of some shells collected by him in the Sunderbuns.

The Curator reported that he had procured from Mutlah an enormous Crocodile, sixteen and half feet in length, for the Society, through the kindness of J. Sturmer, Esq., and H. B. Farr, Esq., of the Mutlah Railway Company, to whom the thanks of the Society are due. The Crocodile is being made into a skeleton specimen for the Museum.

Mr. Blanford proposed that the special thanks of the Society be given to the above named gentlemen; which proposition was put to the vote of the meeting and carried unanimously.

A letter from D. M. Gardener, Esq., C. S., announcing his withdrawal from the Society, was recorded.

The following gentlemen, duly proposed at the last meeting were balloted for and elected Ordinary members:— .

Dr. C. R. Francis, C. B. Garrett, Esq., C. S., W. Swinhoe, Esq., and Rev. J. Ebenezer Marks.

The following gentlemen were named for ballot as Ordinary Members at the next meeting:—

J. Beames, Esq., C. S., Collector and Magistrate of Purneah, proposed by Lieutenant-Colonel F. P. Layard, seconded by N. S. Alexander, Esq.

The Hon'ble Elphinstone Jackson, proposed by W. L. Heeley, Esq., seconded by H. F. Blanford, Esq.

Baboo Taruck Chunder Sircar, proposed by Baboo Jadava Krishna Singh, seconded by Captain W. N. Lees.

Captain E. B. Sladen, Madras Staff Corps, proposed by H. F. Blanford, Esq., seconded by W. L. Heeley, Esq.

R. Jardine, Esq., C. S., proposed by W. L. Heeley, Esq., seconded by Baboo Rajendralal Mitra.

The Secretary read the following letter from Lieutenant C. A. Sim, R. E., to H. Rivett Carnac, Esq., Assistant Secretary to the Chief Commissioner of the Central Provinces, relating to the fossil amphibian lately presented to the Society's Museum, a copy of which letter had been forwarded by the latter to the Society.

From Lieut. C. A. Sim, Royal Engineers, to Harry Rivett Carnac, Esq., Assistant Secretary to the Chief Commissioner, Central Provinces.

Gondwarra, dated 23rd May, 1864.

Sir,—In reference to your demi-official communication of the 30th March last, I have the honour to state, for the information of the Chief Commissioner, that, in company with Dr. Orr, I again visited, on the 21st instant, the spot where the Saurian was found in last July.

I then accurately marked the position in the geological map which you forwarded to me: so I need not again revert to the subject of site. The Nandiya stream has been now examined for some distance on both directions of the Saurian site, but I regret to say that no new fossil has been discovered. The rocks in the bed of the stream are mostly of a very hard sandstone; all appear to have been washed down, and to be continually changing their position. The strike or dip of some of these layers of sandstone was observed to be as much as 30° to the north, whilst the dip of the rocks in the base of the neighbouring hills is but 3° or 4° to the same point of the compass. Occasionally, nodules of basalt and layers of shale are met with in the bed of the stream, and this is easily accounted for when the rising ground in the immediate vicinity is examined, for the hills are nearly all capped with Trap, having a substratum of sandstone with heads dipping 3° or 4° to the north.

The presence, then in the bed of the river of both trap and sandstone boulders of a similar formation to that of the neighbouring

hills, leads to the conclusion that the Saurian stone is not a rock "in situ," ut evidently a loose block washed down from a position perhaps higher up the stream, perhaps from the base of the hills in the vicinity. The dip of the river stones is so various that all those at present visible have evidently fallen from above, and are, in all probability, of a recent displacement. The character of the rocks in the immediate vicinity may be described as trap overlying sandstone, the latter very hard, and with heads dipping 3° or 4° to the north.

Trusting that this information may be a sufficient answer to your demi-official communication previously quoted.

I have the honor, &c.,

(Sd.) C. A. Sim, *Licutenant,*
Royal Enginecrs.

(True Copy)

(Sd.) H. Rivett Carnac,
Assistant-Secretary, Central Provinces.

The Secretary read the following correspondence that had passed, between the Society and the Government of India on the subject of the proposed transfer of their Museum to Government.

From the Secretary to the Asiatic Society of Bengal, To E. C. Bayley, Esq., Secretary to the Government of India, Home Department.

Asiatic Society's Rooms, Calcutta, 5th April, 1864.

Sir,—With reference to the previous correspondence on the proposed transfer of the Asiatic Society's collections to Government, printed copies of which are hereto appended, I am instructed to inform you that the Council has now received full powers from the Society to enter upon final arrangements with Government on the basis recognised in your letter No. 7622 of the 5th December, 1863.

It is deemed highly desirable by the Council that these arrangements should be entered upon with the least practicable delay, inasmuch, as pending the result of the present correspondence, the Council has deferred the appointment of a properly qualified Curator, in succession to their late Curator, Mr. Blyth, and the collections although as far as possible cared for in all that regards their preservation and display. and continually increased by donation and purchase as heretofore are not rendered subservient to the extension of scientific knowledge in the same degree that they would be under a skilled Zoologist.

In accordance with the provision of Rules I. and III. as submitted

in the late Secretary's letter of the 18th June, 1862, the Council will be prepared to make over to a Board of Trustees, to be incorporated by an Act of the Legislature, the management, arrangement and disposal of the collections, together with the right of free access to those portions of the Society's premises which are now devoted to the Museum, until such time as the new Museum Building shall be ready for the reception of the collections. The constitution of the Board of Trustees will therefore be a necessary preliminary to further steps in the transfer.

As, however, some delay must necessarily intervene previous to the completion of the transfer, and as a similar delay must be incurred in the selection and appointment of a qualified Curator to the Museum, it appears highly desirable that the two measures should proceed simultaneously in order that the Museum be placed as soon as may be under the immediate charge of a paid officer. It has been long felt that the extent and variety of the collections are such as to render it impossible for one man to perform the necessary scientific work in connection therewith, and at the same time to undertake their preservation, the disposal and exchange of duplicates, &c., and to carry on the business and mechanical duties of the Museum.

The Society's collections are not indeed at present, of such extent as to require the entire services of two specially educated Zoologists, although such a contingency may be fairly contemplated at no distant period. But the Council would strongly recommend that provision be made for one head Curator or Museum Superintendent of high scientific attainments, and for an Assistant Curator such as may be obtained in this country or in Europe on a moderate salary.

The Society is at present in receipt of a total sum of Rs. 500 per mensem from Government, for the support and preservation of the Museum: this sum will lapse to Government with the transfer of the Society's collection. Should His Excellency the Governor-General in Council think it desirable to invite the Society's recommendations with regard to the appointment of and pecuniary provision for a Curator, I am desired to state that the Council will have much pleasure in submitting its views for His Excellency's consideration.

I have, &c.,

(Sd.) H. F. Blanford,

Secy., Asiatic Society.

From E. C. Bayley, Esq., Secretary to the Government of India,
To H. F. Blanford, Esq., Secy. to the Asiatic Society of Bengal.
Dated Simla, the 8th July, 1864.

Home Department.

Sir,—I am directed to acknowledge the receipt of your letter, No. 177, dated the 5th of April last, and to state that the question of the proposed transfer of the Asiatic Society's Museum to the Government of India, with the view of forming an Imperial Museum, has been submitted for the final sanction of Her Majesty's Government.

2. The Secretary of State has been solicited to select and send out a Curator during the ensuing cold season. The Governor-General in Council is of opinion that until the arrival of that officer in Calcutta, nothing will be gained by the transfer of the Society's collections to Government. The present grant from Government being continued, the Society should make intermediately the best arrangements possible for the preservation of their collections. The exhibition of these should for the present be quite a secondary object.

3. The appointment of Trustees under the contemplated Act will be made on the arrival of the Curator.

4. The necessary steps will be taken in the Public Works Department for the construction of a suitable building for the Imperial Museum. Endeavours will be made to ensure that the building shall be commenced in 1865, and it will, it is hoped, be completed within two or three years.

I have, &c.,
(Sd.) E. C. Bayley,
Secy. to the Govt. of India.

The report of the Council appointing Messrs. J. Strachey and J. Geoghegan, members of their body, was confirmed.

The Chairman then rose and said—

"It is my pleasing duty to announce to the Society this evening the completion of another volume of the very valuable Persian series we are now publishing in the Bibliotheca Indica, and as some account of our progress, and the plan that has been sketched out for us to follow, will be interesting not only to the Society but to Oriental scholars in Europe, I have prepared chiefly from a minute in the Philological Committee, a short memorandum on the subject.

"The present object of the Society in regard to the Persian series of the Bibliotheca Indica, is to aid in working out an idea, which originated with the late distinguished Sir Henry Elliot, *viz.*, to place in the hands of the future historian, the best original materials for compiling a history of this country, and the plan proposed for accomplishing our task is, to publish texts of the most trustworthy authors, giving the preference, when possible, to writers contemporary with the events their histories chronicle.

"I. In this view, we have already published that portion of *Abul-Fazl Baihaki's Tarikh-i al-i Soboktikín* which contains the biography of Mas'úd, the son of Mahmúd* of Ghaznín; and it should be our endeavour, I think, to complete this period from other sources; because the kings of Ghaznín have exercised so material an influence on the progress of events in India, and the affairs of the two countries are so interwoven, that any history of India, without an account of the rise, progress, and decline of the Ghazníu dynasty, would certainly be incomplete.

"I am not prepared to say that materials at present exist and are available for satisfactorily fulfilling this portion of our task, which embraces a period of about 200 years, commencing with Násir ol-dín Soboktikín, and ending with Khosraw Malik, who died A. H. 583.

"II. The succeeding or second period of the History of India, treats of the Afghán dynasties, including the Ghori, the Slave, the Khilji and Lodhi kings. It commenced with M'oiz ol-dín Mohammad Ibn i Sám Ghori, and concludes with Soltán Ibrahím Ibn i Sakandar Lodhi; or, including the interruption caused by the invasions of the Chaghattais, may be carried down to Mohammad Adil, in the year A. H. 963; in which year also Homayún died.

"In furtherance of our object in regard to this period, we have already published the history of Zia ol-dín Barni, which chronicles the reigns of eight kings of Delhi, from Ghaiás ol-dín Balban, to the 6th year of the reign of Firoz Shah, a period of 92 years. Zia ol-dín took up his narrative of events from the point where the author of the *Tabagát i Násiree* left off.

* The poet Onsarí, a contemporary of Mahmúd and the great Firdawsi, wrote Mahmúd's life, and copies of the book were extant in India a century ago. Whether a copy exists anywhere now or not, I do not know. It would be most valuable for the history of this period.

"The *Tabaqát i Násiree* is a general history, compiled by Minhâj ol-dín Jawzjáni. It commences with the birth of Adam, and concludes with the biography of Násir ol-dín Mahmúd b-Shams ol-dín Altimash, the eighth king of Delhi of the Ghori dynasty.

"It must be evident that that portion of Minhâj ol-din's work which treats of ancient history, is of no value for illustrating the history of Mohammadan India. The account he himself gives of this part of his history is as follows:—

"He found, he says, a tabular chronicle compiled by the Imám Mohammad Ali Abu l-Kásim Imádi, in the time of Násir ol-dín Soboktikín, containing in a very concise form, some account of the prophets, the early and later Khalífahs, and something of the life of Násir ol-dín Soboktikín. This he desired to enlarge; and by giving a more extended account of the kings of Arabia and Persia, including the Tobbas of Yemen, the kings of Himyar; the Khalífahs, the Búyahs, Táhiryán, Saffáryán, Samániyán, Saljúkyán, and Rúmyán, so make a complete history.

"But, for this portion of *general* history, we cannot expect to learn anything very new or instructive from Minhâj ol-dín; for, we have older, and better, and more numerous, authorities than those he used; and many of these works have been already printed and published.

"There is, however, a portion of his history which is of great value for our purpose, viz.: that which contains the chronicle of his own times, commencing with the Ghori dynasty, (of the Royal House of which he was himself a *protegé*,) and concluding with Násir ol-dín Mahmúd b-Soltán Altimash. Of the contents of the work, the late Mr. Morley in his catalogue, gave a brief outline: and from the examination I made of the book, his remarks appeared to convey an accurate impression of its value: of the propriety then, of our publishing the portion mentioned, there could not, I think, be a question.

"It might be thought that this author's account of the Kings of the house of Násir ol-dín Soboktikín (in whose time, and by whose order, the chronicle on which Minhâj ol-dín professes to have based his account of this period was compiled) would be valuable. But it appears to be very meagre. The reigns of three or four kings, are sometimes discussed in half the same number of pages, three only being allotted to Mahmud the great, and his twelve invasions of India.

"What is related, however, is doubtless taken from the authorities considered most trustworthy at that early period—authorities some of which are no longer extant; and it will be interesting and satisfactory to this Society to hear that the author supports their opinion of Baihaki as a historian, for he opens his account of this period in the following words: 'The Imám Abu l-Fazl Baihaki relates as follows;' and quotes Baihaki often, in preference to Mohammad Ali Abu l-Kásim Imádi, the compiler of the court chronicle and historian of the time, thus establishing, that he had in his possession the last portion of this valuable history, and leaving fair grounds for us to conclude that he consulted it, as the best authority then extant, for the history of the early portion of this period.

"As it was a matter of serious doubt whether we could obtain full materials for illustrating satisfactorily, the history of this period; and as under any circumstances, Minháj ol-dín's brief sketch appeared valuable as a correct index of the truth of other works, our edition of the Tabaqát i-Násir ol-dín commences from the rise of the Ghaznavide dynasty.

"This work we have now completed, and it forms the third volume of those very valuable histories we have published within the last few years.

"III. The third period of the history of the Mohammadan Kings of India, may be said to commence with the reign of Akbar, for though Babar and Humayoon are numbered amongst the kings of Hindustan by most Mohammadan and all European Historians, it cannot be said that either succeeded in founding a dynasty or in consolidating an Empire.

"In fulfilment of our object in regard to this period, we are now about to publish the Muntakhâb al-Tawáríkh or the Tarikh i Badáoni and it is already in the Press. We have three MSS. and copies of the Tarikh i Nizâmi and the Tabaqat i Akbari, from which the author abridged a large portion of his work. This work is divided into three parts: (1.) The lives and times of the Kings prior to the reign of Akbar; (2) the life and time of Akbar himself; (3) Biographies of the learned and pious men who were contemporary with Akbar; and as giving us the character of the great king, from a different point of view to that of all other historians of the day, this history has a special value for that period.

"The history of the greater portion of the earlier periods we shall already have placed in the hands of the public, in the histories of Minháj al-Din and Ziá al-Barni, far earlier and possibly far better sources of historic evidence than those consulted by Abd al-Qadir i Badáoni: we have thought it therefore undesirable to go over the same ground while the history of other periods remained uncompleted. I think it well worth consideration, however, whether in conjunction with this work, we should not publish in lieu thereof a certain portion of the Tabaqát i Akbari which Abd al Qádir professes only to have abridged, and which all later historians have made such good use of. Sir H. Elliot in his Mohammadan Historians, says that "notwithstanding Ferishtah pronounces his history incomplete, he has borrowed from it very freely." But Sir H. Elliot's translator (for he generally marked his passages, and gave them to others who had more time for translating than he had,) has misinterpreted the passage, for what Ferishtah does say, has quite the opposite sense. He says "of all the Histories of Hindustan that have come into my hands, I have not found a single one complete, *except* the History of Nizám al-Din Ahmad i-Nakhsabi, meaning this "Tabáqát," the only thing wanting according to Ferishtah, being the additional information which he himself possessed and which we may assume he supplied in his own large work.

"It would seem hardly fair, viewing the question of character from that even, disinterested and unbiassed point, and with that jealousy proper to the honest and truthful historian, to publish a history, the greatest value of which consists in 'correcting by its prevalent tone of censure and disparagement the fulsome eulogium of the Akbar Namah,' without, at the same time, supplying the panegyric; the more especially as I find in Badáoni's history, abundant proof that his religious bigotry was such as to render it difficult for him to give an unbiassed and impartial sketch of the character, or to draw right conclusions from the actions of so tolerant a monarch as Akbar. No recommendation has yet been made on this subject to the Society but I hope soon to bring it forward.

"We will then have to consider the reigns of the three great successors of Akbar, Jahan-Gir, Shah-Jahan, and Aurang-Zeb, during which, including the reign of Akbar himself, the glory of the Mohammadan power in India may be said to have attained its zenith. But for this

and the fourth period which we may call the *decline* of the Mohammadan power, no arrangements have as yet been made.

"And here I may convey to the Society the gratifying intelligence which has reached me within the last few days from Mr. Grote, that Lady Elliot has at last placed in the hands of Mr. E. Thomas and our late Secretary, Professor Cowell, the whole of Sir Henry Elliot's MSS. with a view to their being published by our Society, with the assistance which her Majesty's Secretary of State in Council has so liberally offered us for that purpose, and that we shall thus have the means of conferring an inestimable boon on the Oriental World, and at the same time of erecting a noble and lasting monument to that accomplished scholar and distinguished member of our own body, will, I am certain, be most gratifying to all members of this Society who knew him when living, or who honour and respect his memory."

Communications were received—

1. From Lieutenant R. C. Beavan, Revenue Survey;—A few remarks on the Tussch silkworm of Bengal.

2. From Baboo Gopinath Sen, an abstract of the hourly Meteorological Observations taken at the Surveyor General's Office Observatory in May last.

3. From Bábu Rájendralála Mitra, on the origin of the Hindvi and its relation to the Urdu dialect.

After a few introductory remarks, the author, in this paper, takes a retrospective view of the principal changes which the Sanskrit has undergone in its transition to the modern vernaculars of India. The oldest vernacular, next to the Sanskrit, he says, was the *Gáthá* dialect, which prevailed at the time of Buddha's death in the fifth century before the Christian era. This was followed by the Páli in the time of As'oka, Emperor of India, and it changed into the different Prákritas a little before the birth of Vikramáditya. Nothing is known of the north Indian vernaculars for a thousand years after this, until the time of Prithíráj of Kanouj in the tenth century, A. D. when the Hindvi became the vernacular of the most civilized portion of the Hindu race. The Hindvi has since that time undergone many changes and been divided into several dialects, but it is substantially one language, which, in its grammar, bears the closest analogy to the Sanskrit. This the author proves by a detailed analysis of the inflectional and conjugational terminations of the Hindvi as well as of the

auxiliary verbs, and pronouns. The Hindvi among the Mohammadans has become the Urdu. Its grammar is strictly Hindvi, but its vocables are partly Hindvi and partly Persian and Arabic. Thus the Urdu, which is also called the Hindustani, is nothing but Hindvi with a variable proportion of foreign elements. Inasmuch, however, as such foreign admixture does not alter the genealogical affinity of a language, the author contends that the Hindustáni is an Aryan and not a Semitic dialect. He next enters into an examination of the capability of the Roman characters to represent the phonology of the Hindvi and the Urdu, so as to supersede the use of the Native alphabets, and comes to the conclusion that the introduction of these characters into the Mofussil Courts, for the writing of Native dialects would be troublesome, impolitic, mischievous, and in no way conducive to the good of the people;—troublesome, inasmuch as they cannot be used for the Native languages without a multitude of diacritical marks which, in Lepsius' Standard Alphabet, affect no less than 160 letters, and which can never be attended to in rapid writing; impolitic, because it will create disaffection among the people who cannot but look upon the supersession of their ancient and superior alphabet by an imperfect one utterly unsuited to their wants, as highly oppressive; and mischievous, because it would lead to frequent and serious mistakes in the judicial records of the country. The great want of India was a *lingua franca* and not an universal alphabet, which last, without a common language, would be a name and an idea, but of no possible practical good.

Captain Lees said:—"I did not anticipate it would be necessary for me to say anything this evening; but as no other member of the Society has risen, I cannot allow the meeting to separate without an expression of opinion that our special thanks are due to Babu Rajendralala Mitra, for the excellent paper he has just read, on a very interesting subject. It will hardly be credited by the members of this Society, who may be supposed to be better informed on this subject than the outside public, that notwithstanding the Hindustanee language is the *lingua franca* of India, and understood from Peshawur to Cape Comorin, and notwithstanding that the English have had India now for upwards of a century, the Essay that we have just heard read, is the first scientific paper of the kind that has ever been written in India. Dr. Trumpp's paper on the dialects of India, t

which the Babu has frequently referred in his lecture, may have been prepared in this country; on that point I am not informed, but it was published in a foreign journal and must be credited to the country to which that journal belongs. While expressing, however, my great satisfaction at the manner in which the subject has been handled, I must correct an error into which the Babu has fallen, in stating that I had said that the Hindvi or Hindi had no alphabet of its own. He has been led into this error probably by an imperfect recollection of what I said, as when he has had the benefit of reading my paper in print, he will see that what I did say has quite a contrary sense. The language which I said had no alphabet was the Hindustani, and the only difference between us appear to be that while he has considered the Hindvi or Hindi, the Hindustani, and the Urdu as one language, I have considered them as three languages. If it be admitted, what is asserted, that ninety per cent. of the vocables of Hindi are Sanscrit, which I think is probably true, I am not at all prepared to admit that in Urdu the proportion of Arabic and Persian words is only fifty per cent. In ancient Urdu, it was much less; but if the Babu had read the Soroor i-Sultani and many modern works published at Lucknow and Agra, he would find that the percentage of Indian words in them is quite as few as the percentage of foreign words in Hindi. In short, it is so infinitesimal, that this element can hardly be recognised at all; and to such a language, I think the Deva Nagri Alphabet would be quite as inapplicable, as the Roman alphabet would be to Hindi. I think, moreover, that my learned friend has laid too much stress on the influence the origin of a language ought to have on the characters in which it is written. This, in my opinion, has very little to do with the question, as alphabets in all countries of the west have been children of adoption, foreign to the countries and the languages which have adopted them. Turning again to the more immediate subject of the lecture, I am quite prepared to admit, that the balance of evidence in regard to the grammatical structure of Hindi, in common with the other Vernacular dialects of the Upper half of India, is strongly in favour of its having reached us through the Prakrit from the Sanskrit; but I do not think that the arguments used by Dr. Trumpp, nor yet the additional arguments that we have heard this evening, are sufficient to satisfy those who hold opposite views. It must be borne in mind that one of

the laws on which the dignity of a science is claimed for language, and on which Babu Rajendra Lal Mitra has based his strongest arguments, is that of phonetic corruption and grammatical regeneration, whereas it is impossible to arrive at a Sanskrit origin for the vernaculars of upper India, or for the Hindi dialect at least, without violating this law, and admitting grammatical or structural corruption as far more serious than anything that has taken place in phonetics. I do not at all wish to dispute the position, for, as I before said, the balance of evidence is certainly now in its favour; but the subject is not exhausted, and cannot be exhausted until we know more of the numerous dialects which are spoken by those rude people who inhabit the fastnesses of our central and frontier ranges of mountains. These dialects we may count almost by scores, but of the most of them we literally know nothing, and until we do, it is almost impossible to say what influence, (if any) they have exercised on the modern vernaculars, or even the older dialects of India. The learned lecturer has drawn attention in the opening of his paper, to the influence that special knowledge has had on discussions on this highly interesting subject, but in admitting the justness of his remarks, it becomes doubly necessary to guard against falling into the very error of which he has warned us. It is not very long ago, indeed the time is so short, that it will be in the memory of most here present, that all language was supposed to be of Semitic origin: our sacred Scriptures were written in Hebrew; our earliest history records were transmitted to us through that medium; all the dialects which are now current in the regions of its birth, and all those which existed for ages past and were lost, were asserted to have sprung from this most ancient of all languages. But little more than half a century ago, the researches of Sir William Jones, Colebrooke and other distinguished members of this Society, and addresses read from the very chair, which I now accidentally and unworthily fill, let in a flood of new light, which has since revolutionized European ideas on the subject of language; and it is not twenty, nay it is hardly fifteen years ago, that the antiquity claimed for Sanskrit was resolutely disputed by men of high attainment. For the last ten or fifteen years, however, everything has been Sanskrit; and the learned lecturer, in common with most others who have written on the subject, has traced all our Indian dialects back to that mother tongue. Now, at the present day, it is impos-

sible to refuse to admit that the Sanskrit language is of most remote origin—so remote, that with our present imperfect means of research, we find ourselves entirely at fault, if we attempt to elucidate its early history; but though it is impossible to discover a new language like the Sanskrit, bearing in mind what has taken place, and looking to the rapid strides that within the last two or three years have been made in researches in the Zend language of the ancient books of the Parsees, and the arrow-headed Inscriptions in that language, we must not put out of mind the possibility of our one day being in a position to ask, "If all the modern dialects of India are based on the Sanskrit language, on what language is the Sanskrit itself based?" Nor in making this remark do I wish to cut anything off the age of the Sanskrit. At present, the language is altogether prehistoric, and may possibly remain so for ever. We cannot be blind to the fact, that speaking chronologically, we are first brought in contact with it not at the beginning but at the end of a period. The first date which we can grapple with anything like chronological precision, is that of Sakya Muni, and his era records,—not the dawn of a civilization such as we meet with in tracing the early history of many other nations we now call ancient, but a revolution and the overthrow of a religion, and a system which had existed certainly for very many centuries before, and in which he was not the first reformer. That the Vedas are long anterior to the period of Sakya Muni, his existence is sufficient proof. But beyond this isolated fact, besides the internal evidence furnished us by the Vedas themselves, we have little to guide us. The exact spot from whence the Aryans came is doubtful; when they entered India we cannot even conjecture; but if by the *rakhshases*, *daityas* &c. spoken of in the *Mahabharat*, (which no doubt contains the history of a period much anterior to that of its composition,) and represented by the learned lecturer as being driven to take refuge in the rocks and caves of the hill fastnesses, and in a great measure exterminated, as have been the red Indians in North America, are to be understood the aborigines of India, it appears to me, that we shall have some difficulty in placing that remnant of the other colony which now inhabits the southern half of the Peninsula, and whose languages, the Tamil and Telinga, proclaim them to be of Scythian origin. It is generally admitted that these people reached India by the same route as the Aryan colony, and how they could

have travelled south, if the north had been already occupied by a strong and powerful race of Aryan people I do not quite comprehend. We have incontestable proof in late researches, that the religion of China went from Ceylon, and that India received nothing from the seaboard. But I must not detain the meeting longer. The subject now so ably handled by my friend Babu Rajendra Lal opens up questions of the deepest interest in Ethnological, Philological and Historical points of view, which instead of being exhausted, are comparatively fresh; and I trust that the interest excited by his paper will be such as to ensure us many more of them from other parts of India from persons as competent to deal with the difficulties with which they are surrounded as he is."

The Honourable G. Campbell had great pleasure in very heartily seconding the proposal for a vote of thanks to the learned member whose most interesting and instructive paper had been heard with so much profit. Not being himself a scientific linguist, he could not presume to pronounce an opinion on a matter which depended on a skilled comparison of Grammar and structure, but the subject was one which had been too much neglected: he was sure all the members took the greatest possible interest in it. The arguments of the learned gentleman seemed most convincing, and if much might still be said on the subject, all must feel under the greatest obligation to the learned gentleman for so well broaching it, and provoking a discussion which will no doubt eventually throw complete light on the matter.

One word he would like to say as a mere lay bystander, on the point last noticed by the learned gentleman, viz., the character to be used in writing the Vernacular language. He had understood the learned gentleman to say,—that the character used by the unhappy gentleman of Agra, who was so unfortunate as, by a badly written note, to induce his wife to commit a premature Suttee, was Hindi. Now, he must say that story seemed to tell against the learned gentleman's argument, for Hindi being one of the Nagri characters which he extolled, if all adopted that character, a similar inopportune accident might happen to any one of the present company. The fact seemed to be, that although the Nagri in print or carefully written, is a very clear and precise character, it appears to be too angular and square for use in common writing, and in all parts of India some rounded modifications of it had been adopted for ordinary

use. Those modifications were exceedingly difficult to write and read. As regards the most common character, the Hindi, he must say, that he had known many people who wrote that character, but very few who could read their own writing, and scarcely any who could read any one else's writing. Bengali might be better, but, coming as he did from a part of the country where the Persian character was used in official business, to one where the Bengali character was used, he could not but be struck with the very great inferiority of the latter for practical purposes, being as it was, so very slow to write and so little rapid or smooth to read. Those defects seemed to affect all the modifications of the Nagri commonly used, and he doubted whether they could be got over.

Then as respects the Roman character, the remarks of the learned gentleman suggested to him (Mr. C.) what had occurred to himself, viz., that in the discussion on this subject, sufficient place had hardly been given to the very important question, whether in fact this Roman character is really good in a phonetic point of view; whether it has phonetic qualities of that catholic stamp which would render it fit for universal use. Being as he had said not scientific, he could not venture an opinion on this point, but as a practical man he could not help mentioning that doubts had occurred to him, from what he had seen of the use of the Roman Alphabet, when applied to two languages foreign to it. One of these was the English. Now they well knew that no language in the world was written in a less phonetic way; in none was there such a discrepancy between the writing and pronunciation, so much variety and uncertainty in the use of the same letters, and so arbitrary an attribution of various sounds to those letters. He could not but fear that great part of this difficulty might be due to the application of a foreign Latin Alphabet to a Teutonic dialect to which it was unsuited. Again, we had seen a partial application of the Roman character to the ordinary vernacular Hindustani of this country. And he confessed that such attempts as he had seen, appeared formidable and horrible to the eye, and he never could make head or tail of them. The immense variety of spelling when Roman letters are applied to Indian words, also seemed to indicate difficulty. A gentleman had two or three years ago published a guide book to India, in which for the expression of Indian names and terms, he used the Roman alphabet in what he considered

a phonetic way. The result was, that it was impossible to recognise the most familiar of our old friends. To take an instance, we know 'Cawnpore,' well enough but when we come across 'Khanpur' we can make nothing of it. It did appear to him that the phonetic excellence of the Roman character had yet to be demonstrated.

There remained the Persian character now so extensively used throughout a great part of India. Of course he meant the Arabic character as modified and used in the modern Persian, and here generally called the Persian character. He had much practical experience of the use of this character, and thought it could not be for one moment denied, that for ordinary business, and all the purposes of cursive writing, this character possessed enormous advantages. It is true, he said, that there is a want of precision and certainty about it, when used to express foreign proper names and words not of customary use, being in fact, as ordinarily written, a sort of refined short hand; but even this could be for the most part remedied by the use of Arabic punctuations in regard to particular doubtful words, and by the introduction of our stops and capitals. It is also true that the free use of this character requires much practice; that in fact it is not fitted for rude beginners, and can only be used with advantage by highly educated people. But as used by them, it undoubtedly possesses a facility both for writing and reading unrivalled, and is not only first, but is without a second. The rapidity and facility with which business is conducted in this character, as compared with any of the Nagri forms or even with English, is astonishing. In truth he could hardly doubt that as it is a later product of the human mind, so it is a more refined and polished instrument of human art than the Nagri or Roman characters.

Without therefore venturing an opinion, which he was ill-qualified to prove, he would only venture with much diffidence to throw out a suggestion whether there might not be advantages in the simultaneous use of several alphabets now prevailing in the greater part of India. The arguments of the learned gentleman whose paper they were discussing, had certainly suggested to him grave doubts whether uniformity of alphabet is really so great an object, when there is diversity of language, for as the learned gentleman well said, the time required to master an alphabet might be measured by hours, while that required for a language must be measured by years. If then a

second Alphabet renders the use of a second language more easy, might not the hours required to master the second Alphabet be well spent? His suggestion then was this: whether the vernacular Alphabet of Nagri type or better the Nagri itself might not still be used for the lowest form of instruction and the expression of the most vernacular form of languages by villagers and children; also perhaps for matters of accounts and some village records, whether the higher education of all the more educated classes might not still be conducted in the Persian character, so much the best for cursive epistolary and ordinary business transactions; and whether, for the higher official business and record, for the higher literature, languages and science, the English language might not gradually be brought in, instead of attempting to force the Roman character before the English language.

For September, 1864.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 7th instant.

Captain W. N. Lees, Vice-President, in the Chair.

The Proceedings of the last meeting were read and confirmed.

Presentations were received—

1. From Lieutenant Waterhouse, a set of Photographs of ruins at Pathari.

2. From Major General A. Cunningham, a rubbing of an Armenian Inscription from a grave-yard in Behar. The Inscription was sent to Mr. J. Avdall, by whom it has been translated. He says—"It is devoid of any public or literary interest."

3. From Lieutenant R. C. Beavan, a collection of Indian Lepidoptera and a grass Parrakeet.

4. From J. Cock, Esq., a collection of Coleoptera from Assam.

5. From W. L. Heeley, Esq., a Mantis.

6. From Major C. Herbert on the part of A. Grote, Esq., a Kangaroo.

7. From Mr. C. Swaris, a Bird of Paradise.

8. From Captain A. B. Melville, a set of Stereoscopic Photo-

graphs* representing the principal characters of a mystery play witnessed by him at the Hisnis Monastery between Leh and Ladak.

The following letter accompanied the presentation :—

"*Dehra Dhoon, August 20th*, 1864.

My dear Sir,—In the beginning of 1863, as we were marching up through Ladak towards the Pungong Lake, where our survey operations for that year were to be carried on, we were delayed several days by rain at the village below the celebrated Boodhist monastery of Hisnis, which is situated in a lateral ravine about two marches up the left bank of the river Indus above Leh. While encamped here, we got information from one of our guides about the religious mystery plays performed by the monks on certain religious festivals. They are mentioned in Moorcroft's Travels, Vol. I. page 345. By means of a present to the Abbot, we persuaded him to give us a private performance. Luckily, having photographic apparatus with me, I arranged to take negatives of ten of the principal characters, prints of which I now enclose. I have put the names I obtained on the back of each.

I was greatly struck with the resemblance of this play to the Burmese *poeys* (or Nautch,) that I saw in 1853, particularly as to the masks and demons introduced, and I have been informed by an officer who assisted at the reception of the Burmese Ambassadors in Calcutta, that the head dress shown in No. 6 is almost identical with some of the head dresses then worn by the Burmese. It struck me also that there was a very strong resemblance between this play and the old Roman Catholic feast of Unreason or All Fool's Day, so well described in one of Sir Walter Scott's novels, either the Abbot or the Monastery. The Band shown in No. 10, throughout the whole of the performance, kept up a low monotonous music, accompanied by a low chant of monks. The figures came in, generally in groups of 5 and 6, and after dancing a short time, retired into the monastery, and were replaced by others: occasionally a jester and a sort of harlequin, with him, came in with the other characters, and played practical jokes on each other.

* Endeavours will be made to reproduce these for publication in a future number of the Journal, in conjunction with a more detailed description of the play, communicated by Captian H. H. Godwin Austen.—Eds.

The plot, as far as we could make out, seemed to be a Ladaki Royal Court, with gods as the chief personages instead of kings, and, in one part of the performance, the characters represented in No. 4, and several others came in, attending on Thlogan Padma Jagnas who had a large umbrella held over him. These then performed a slow solemn dance.

The characters represented in No. 3 were always seated in line, with the bell and a small drum in their hands, and appeared to represent the courtiers. There is a wonderful resemblance in their dress to some of those worn in Roman Catholic processions.

The dresses were very handsome, being made of thick China silk covered with devices, in which the dragon continually figured. The masks were beautifully made of papier mâché. One peculiarity about the costumes, is the continual use of the human skull as an ornament, as shown in Nos. 4 and 5; and nearly all the masks have three eyes, one in the centre of the forehead.

The figures in No. 1 had a most remarkable hat with long streamers of different coloured silk flying behind. Their dress was, I think, the handsomest, and as they moved round in a sort of revolving dance had a strange and very novel effect.

The great peculiarity of No. 2 was that they had masks of brightly polished brass, which the name indicates, *azong* Copper and *bukha* masks. No. 9 appeared to represent some sort of fight. There were twelve characters, all with flags, with three eyes painted on them, fastened to the top of their head dress. They were all dressed alike, with the exception of 6 having red masks and 6 brown. The red masks *(Numking)* came running in from one side and the brown *(Tsaking)* from the other, and performed a sort of war-dance, striking each other's drums, &c., and then retiring as they had come in. No. 7, was perhaps the most remarkable of all the dresses: it was an attempt to represent the dance of death. Only two characters came in, dressed as skeletons; their masks were beautifully made, and had springs by which the jaws opened and shut, and thus enhanced the effect.

No. 8 apparently represented the divinity to whom the monastery at Pituk near Leh, is more particularly dedicated.

Besides the characters I have described, there were many more, but very similar, and I think the photographs I have sent will give a very fair idea of the costumes and dresses. What is the meaning of these

plays and whence their origin, is a point well worth inquiry. Captain Godwin Austen, who was one of our party was lucky, enough to purchase a manuscript giving the stage instructions for these plays; he is trying to have it translated, and I hope it may throw some light on the subject.

From the monks themselves it is impossible to find out any thing; either the origin and meaning of these plays has been lost, or is confined to the monasteries near Lassa, or else they are unwilling to divulge the mystery.

Captain Godwin Austen told me that as he was returning by the Gaurin monastery, he saw a similar mystery play going on: only they had the body of a man made of dough in the centre, on a sort of bier, and they were dancing round, firing arrows into the body and cutting at it with swords. This reminded me very much of the old days of magic in England, when we read that to do a person an injury the magician used to make a figure of that person in wax, imagining that the wounds and tortures he inflicted on the figure would be extended to the actual person.

I hope shortly to send another set of photographs, illustrating the monasteries and idol rooms of Ladak.

Hoping that this slight sketch may interest some of the members of the Society.

I remain, &c.,

(Sd.) A. B. Melville, *Capt.*,
G. T. Survey.

To the Secretary, Asiatic Society, Calcutta.

Bábu Rajendralála Mitra read the following note on a hoard of Páṭhán Coins lately discovered in Cooch Behar.

"A short time ago, Colonel Haughton announced the discovery of a large hoard of ancient Coins in Cooch Behar, and suggested that it might be received as bullion by Government, as part of the annual tribute of the Cooch Behar estate, in order to enable numismatists in Calcutta to have a sight of it.

"The Coins have since been received at the Mint, and I have had several opportunities of examining them. They number 13,500, and comprise specimens of the coinages of eight of the Páṭhán sovereigns of Delhi, and of four of the independent Páṭhán kings of Bengal.

"Though presenting no great features of novelty, these coins are

of interest as affording a number of varieties which were hitherto unknown. This is what was to be expected in a large collection, inasmuch as the art of die-cutting was in so primitive a state in the days of the early Páṭháns, that no two dies could be turned out exactly alike, and their produce was necessarily very different. Muhammadan sovereigns, besides, took great interest in the designs of their coins, and frequently changed them, and in long and prosperous reigns this too led to a great multiplication of types and varieties.

"The great bulk of the find consists of the coins of Shamsuddin Iliás Sháh Bangarah, Sikandar Sháh bin Iliás, and Ghyásuddín Azim Sháh bin Sikandar, three of the earliest independent kings of Bengal. Of the first of these, there are three distinct types, the first having the legend enclosed in a large circle on the reverse, and the second in a small circle; the third having a double line square framing on the obverse. Of varieties of these types there are no less than 20, but they are due entirely to the die-cutter, and therefore call for no notice. Of the coinage of Sikandar, son of Iliás, there are no less than six distinct types, four of which have not hitherto been noticed by any antiquarian. One of them offers the rudest specimen of coin in the whole collection, and another as good as any that has ever been issued by a Bengal Páṭhán. Ghyásuddín, son of Sikandar has five types and no less than fifteen different varieties.

"Of the other Bengal Páṭháns whose coins occur in this trove I have to notice Firuz Sháh the Abyssinian, who appears with the *prenomen* Shamsuddín instead of the commonly known Tájuddin, and Bahádur Sháh, who raised the standard of revolt in A. D. 1317, during the reign of the effeminate Mubárik, and for some years successfully maintained his independence. The time of Báhádur was occupied in organising and strengthening his newly-acquired principality, and he had little leisure to think of the design of his coin. He affords, therefore, a single type and a very indifferent specimen of Bengal rupee. Mr. Laidlay does not include this prince in his paper on the coins of the Páṭhán kings of Bengal, but his independence was complete, and I see no valid reason for excluding him. The number of his coins in the trove exceeds 200.

"The Delhi Páṭháns represented in this trove are Ghyásuddín Balban, Muázuddin Kaikobad, Jelláluddin Firuz, Alláuddin Muhammad Sikandar Sáni, Ghyásuddin Tughlak, Fakheruddin Mohammad

and Mohammad Ádil Sháh. The total number of their coins does not exceed 150, or about one-fiftieth of the whole. There is only one type of each reign and of the earlier kings not more than two or three specimens each. The coins of Tughlak Sháh and Mohammad Ádil are of new types, the latest coin in the hoard is that of Ádil Sháh who ascended the throne of Delhi in 1552, and the hoard therefore must have been buried within a few years after that date, or about three hundred years ago. The number of Ádil Sháh's coins does not, however, exceed a couple: the great bulk of the hoard is made up of coins of the 13th and 14th centuries, it must therefore have been collected two centuries before it was buried.

" The following is the list of the different kinds of coins found in the trove:—

LIST.

Delhi Páṭháns.

1. Ghyásuddín Balban, A. D., 1266 to 1286, 10th King.
2. Müázuddín Kaikobád, 1286, 11th ditto.
3. Jelláluddin Firúz, 1288 to 1295, 12th ditto.
4. Alláuddin Muhammad Sikandar Sáni, 1295 to 1316, 14th ditto.
5. Ghyásuddin Tughlak Sháh (new type), 1321 to 1325, 18th ditto.
6. Fakheruddin Muhammad bin Tughlak, 1325 to 1351, 19th ditto.
7. Muhammad Ádil Sháh (new type), 1552 to 1553, 39th ditto.

Bengal Páṭháns.

Ghyásuddin Báhádur Shah, 1317 to 1322.

Fakheruddin Mubárik.

Shamsuddin Iliás Sháh Bangarah, small circle reverse, 1343 to 1358

Ditto ditto, large ditto.

Ditto ditto, Square field obverse.

Sikandar Sháh bin Iliás, Rose field reverse, 1358 to 1367.

Ditto do., Hexagonal field reverse.

Ditto do., small circle reverse.

Ditto do., large do. do.

Ditto do., short legend, rude letters.

Ditto do., field on the obverse formed of a rose with 4 petals th margin having 4 circlets, the field on the reverse has an angular figu with 6 salient and 6 receding angles.

Ghyásuddin Á'zam Sháh bin Sikandar, lozenge obverse, 1367 to 1373.

Ditto ditto, square ditto.

Ditto ditto, field on the obverse square having scalloped projections from the middle of each side, the reverse a rose of 4 petals.

Ditto ditto, square obverse, lotus reverse.

Ditto ditto, circular obverse and reverse.

Shamsuddin Firúz Sháh, A. D. 1491.

Bábu Rájendralála Mitra also exhibited a set of the Zodiacal rupees of Jehangir (except Scorpio and Aquarius) and a bacchanalian medal of that Emperor belonging to the collection of Colonel Guthrie. The rupees bear the Agra mint mark, and the same legend throughout, but their dates differ, Leo, Taurus, Gemini and Virgo being of 1028 H, Aries of 1030 H, Libra, Sagittarius, Capricornus and Pisces of 1031, and Cancer of 1033 H. Their excellent state of preservation and the fact of the figures of Aries, Taurus, Gemini, Libra, and Sagittarius, being unlike those to be met with on genuine Zodiacal rupees, but very similar to those of the Zodiacal Mohurs, suggest the idea of the rupees being forgeries, probably of the batch which is said to have been coined by General Claude Martin of Lucknow.

The medal was described as new, having an effigy of the Emperor seated in the centre and holding a decanter of wine in one hand and a cup lifted to his mouth in the other, with a legend round the margin. The reverse has on the field the figure of a lion *passant* with the sun rising behind it, and a legend on the margin. The figures represent the entrance of Sol into Scorpio and are emblematic of the birth of the Sovereign on a Sunday in the month of August. In its style of workmanship and state of preservation it is equal to the best specimen of Jehangir's coinage. Marsden in his *Numismata Orientalia* has a figure of a bacchanalian medal of the Emperor, but the legend in it is given on one side. He also alludes to a medal in the Collection of Mrs. Welland, which has the legend round the margin, but the wording of which appears to be different.

The word *ibn* in the legend, the Bábu said, was suspicious, inasmuch as it occurs in no other coin of Jehangir, but he accounted for it on the ground of exigency of the metre in which the legend was written. The bacchanalian character of the figure, he added, was in no way unbecoming a monarch who, in his autobiography, reckons the daily

allowance of his drink at 25 glasses of double distilled arrack, however much the parade of such weakness was unbecoming in a Moslem.

The legend in the obverse is—

شبه شاه نور الدین جهانگیر ابن اکبر شاه
بروی سکهٔ زرداد چندین ذیب و زیور

Ditto on the reverse—

شاه نور الدین جهان گیر ابن اکبر بادشاه
زد میزر این سکه در اجمیر شاه دین پناه

The Honourable George Campbell observed that he would take advantage of the introduction of the subject of coinage to enquire, with reference to a statement in "Purchas," now under republication in the *Englishman* newspaper, that there was a coin in currency in the Mogul times called Seraffin, of the value of 10 Rupees, whether they might not be the origin of the English "Sovereign." He threw out the suggestion, merely as likely to lead to an interesting enquiry, and perhaps to show that recent financial measures have been anticipated so long ago as the time of Jehangir.

The following gentlemen duly proposed at the last meeting were balloted for, and elected ordinary members: J. Beames, Esq., C. S.; The Hon'ble E. Jackson; Baboo Tarruck Chunder Sircar; Captain E. B. Sladen, and R. Jardine, Esq., C. S.

The following gentlemen were named for ballot as ordinary members at the next Meeting:

Baboo Bhoodeb Mookerjee,—proposed by Baboo Gourdass Bysack, seconded by Mr. Heeley.

H. H. Locke, Esq., Principal of the Calcutta School of Art,—proposed by Mr. Heeley, seconded by Mr. H. F. Blanford.

The Hon'ble J. B. Phear,—proposed by Capt. Hyde, seconded by Mr. H. F. Blanford.

Col. W. D. Short,—proposed by Mr. Heeley, seconded by Mr. Geoghegan.

C. W. Hatton, Esq., proposed by Mr. Heeley,—seconded by Mr. H. F. Blanford.

The Council reported that the following gentlemen had been elected to the Committees.

Philol. Committee.—H. C. Sutherland, Esq.; Nat. Hist. Committee Baboo Debendro Mullick; Statistical Committee—C. B. Garrett, Esq.

They also reported that they had added a Durwan and a Ferash to the establishment of the Museum.

Communications were received—

1. From the Ven'ble J. H. Pratt, a letter on his paper entitled "on the degree of uncertainty which local attraction, if not allowed for, occasions in the map of a country, and in the mean figure of the earth as determined by Geodesy; a method of obtaining the mean figure free from ambiguity by a comparison of the Anglo-Gallic, Russian, and Indian Arcs; and speculations on the constitution of the earth's crust."

2. From Baboo Gopeenath Sen, an abstract of the hourly Meteorological Observations taken at the Surveyor General's Office in June last.

3. From H. B. Medlicott, Esq., a note relating to the Sivalik Fauna.

4. From Lieutenant Colonel E. T. Dalton, notes during a tour in 1863-64 in the Tributary Mehals, under the Commissioner of Chota-Nagpore, Bonai, Gangpore, Odeypore and Sirgooja.

5. From the Rev. F. Mason through Colonel Phayre, answers to the "queries for travellers" embracing Religion, Mythology and Astronomy among the Karens, with a vocabulary of eight dialects.

Mr. H. B. Medlicott read a notice referring to his description of the Sub-Himalayan rocks in the Memoirs of the Geological Survey of India, Vol. III. p. II. The deep unconformability between the upper and middle groups of those tertiary deposits had led him to question a statement that fossils had been found in the older groups, of the same kind as those in the true Sivalik beds. Sir Proby Cautley sets at rest the fact of fossils being found in the inner Zone; and re-affirms his opinion that they are the same as some of those from the Sivaliks. The inference, therefore, becomes very strong, that in the Fauna Sivalensis two separable stages have been confounded: the deep unconformability along the inner boundary suggests a far greater separation than could be surmised from the mere fact of succession as apparent in the outer section. As Colonel Cautley's collections from those special localities have been lost, the question must wait for fresh data.

Mr. Blanford made some observations on this paper.

A memorandum by Dr. Williams on the question of British Trade with Western China *viâ* Burmah was then read by the Secretary:—

Dr. Williams first touches upon the political state of the countries between the Bay of Bengal and Central China, and shows that the feelings of the Burmese Government with regard to the promotion of British enterprise had undergone a favourable change. After dealing with the condition of the Karen and Shan States, he explains the political position of the province of Yunan, where the rebel Government of the Pansee, or Chinese Mussulmans is now predominant; and he states that it appears to be the wish of that government to facilitate communication with the West. The Singpho or Kahkyan tribes stretching from North Assam round the North of Burmah to Western China have of late assumed practical independence with regard to their Burmese Suzerain, but also appear to be quite prepared to give a passage to traffic, on certain conditions of black mail.

The next subject is the physical character of the district, viewed with reference to the selection of a line of route for trade. The Salween is not navigable, and the formation of a road from Showgyeen to that river and along its valley to Mantungye, or across the hills to the Cambodia river, is rendered impassable by the steepness of the mountain passes which would have to be traversed. The route from Mandalay to Theinnee also contains one difficult and almost impossible ascent, although, this once overcome, there is an uninterrupted plain to the centre of Yunan. The ascent of the Irrawaddy above the capital is practicable to Bamo, for steam navigation, but the defile above Bamo would form an insuperable obstacle to further progress. East of Bamo, however, the range of hills, though not fully explored, appears to present fewer difficulties than in any other direction; and when once crossed, there is no obstacle to the construction of any kind of road or railroad. This, therefore, is the route which Dr. Williams recommends.

He then proceeds to enumerate the commercial advantages to be expected from this communication. Coal crops out in several places near the Upper Irrawaddy, and there are large deposits of magnetic oxide of iron, producing steel of first rate quality. The lead ore in one of the mountains is exceedingly rich in silver. English manufactures of the most inferior kind find a good market in Upper Burmah and among the Shans; and the trade might, with better roads, be indefinitely

extended. Yunan itself with its ten millions of population is a most important district; it produces cotton, silk, and the finest tea. Sechuen, with a population of thirty millions, is at least of equal importance. Dr. Williams gives much detailed information respecting the products of these provinces, and the articles of British manufactures which are likely to find a market in Yunan.

He concludes by pointing out that the Bamo route, the ancient highway of trade between China and Burmah, is the route to which there are fewest objections, both for railroad and telegraphic communication; that even the construction of an ordinary road would immensely aid traffic, and that the revival of this traffic would be of immense advantage to China, Burmah and Britain, and to the cause of progress generally.